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FEBRUARY 23, 1957
VOL. 152—NO. 8

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

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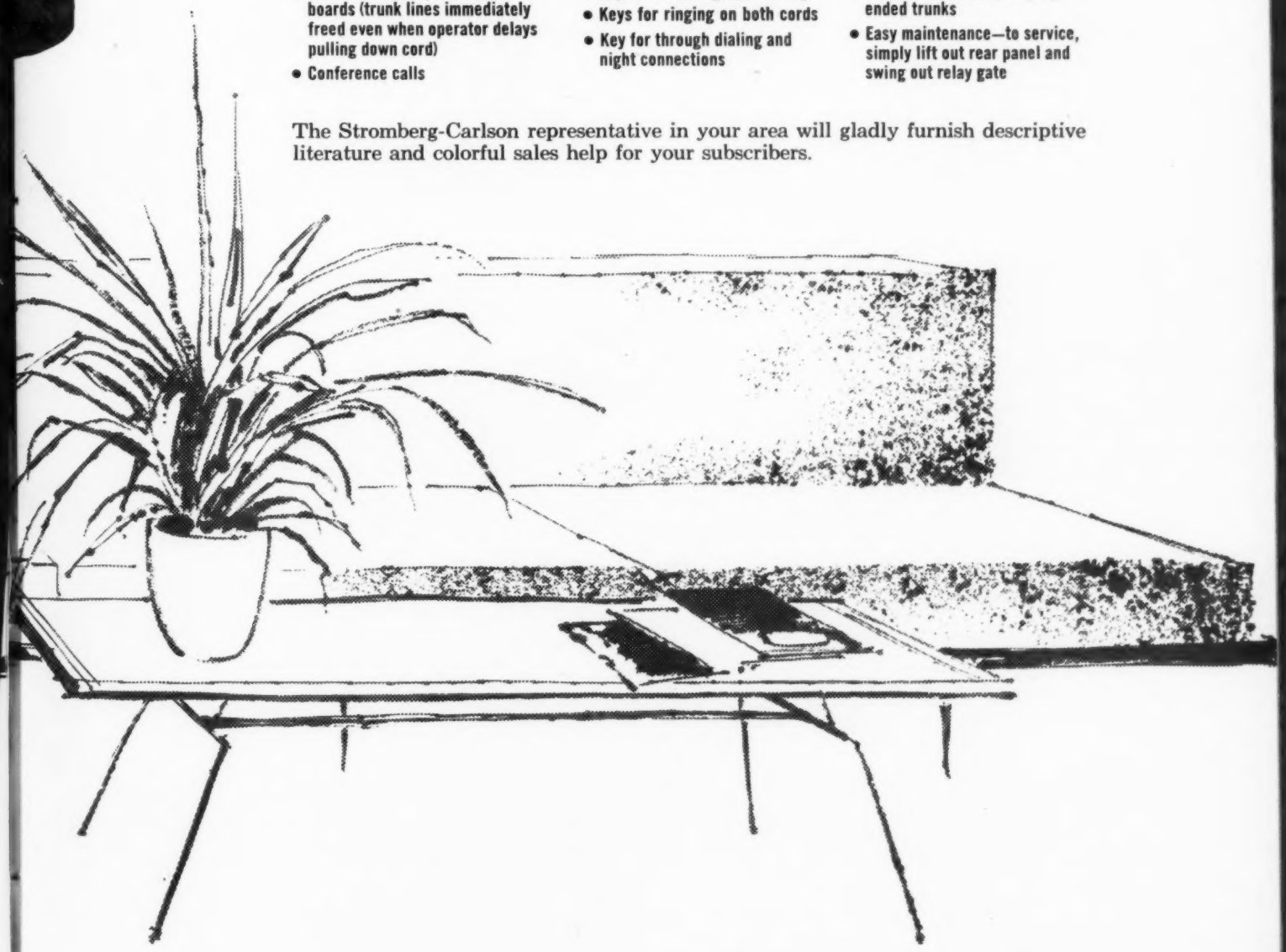

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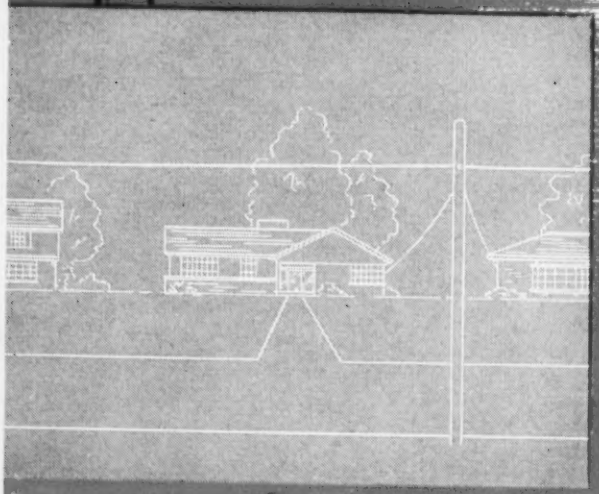

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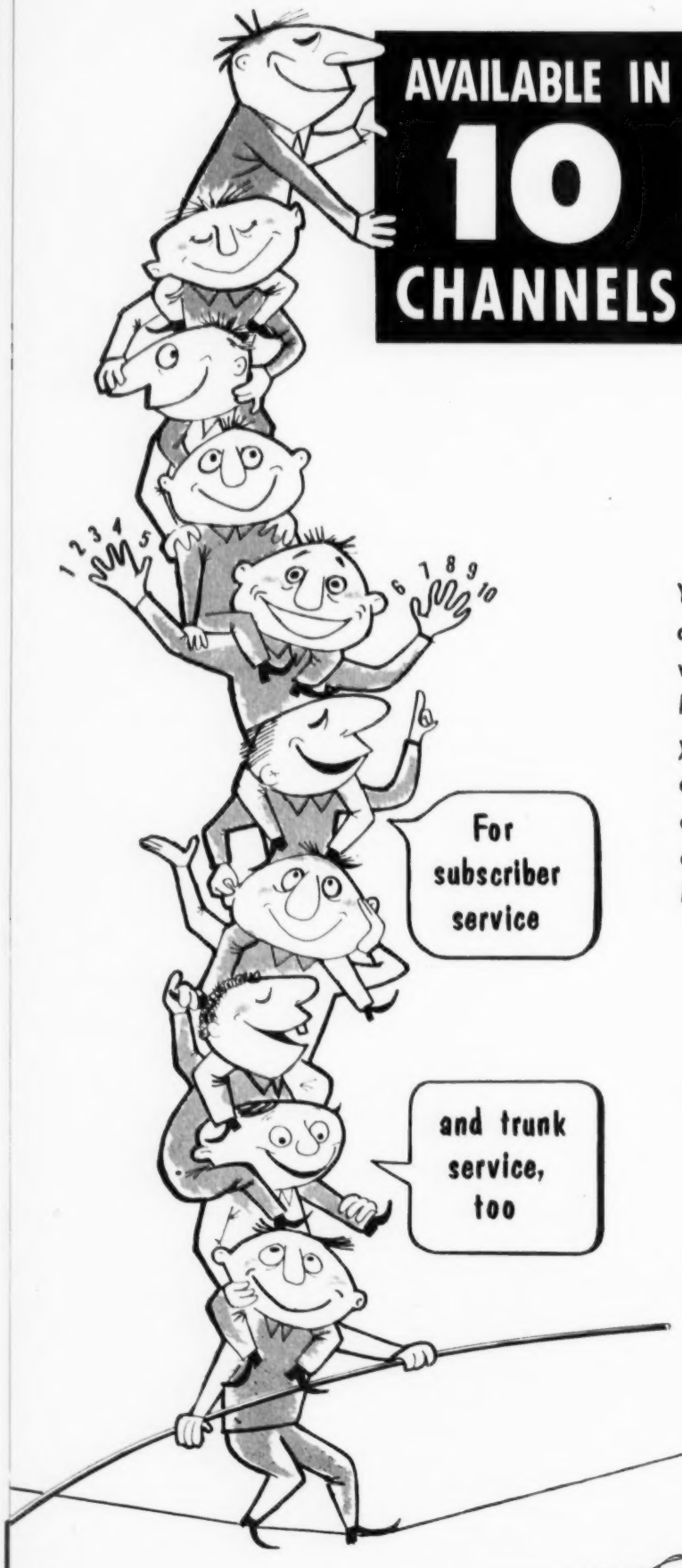

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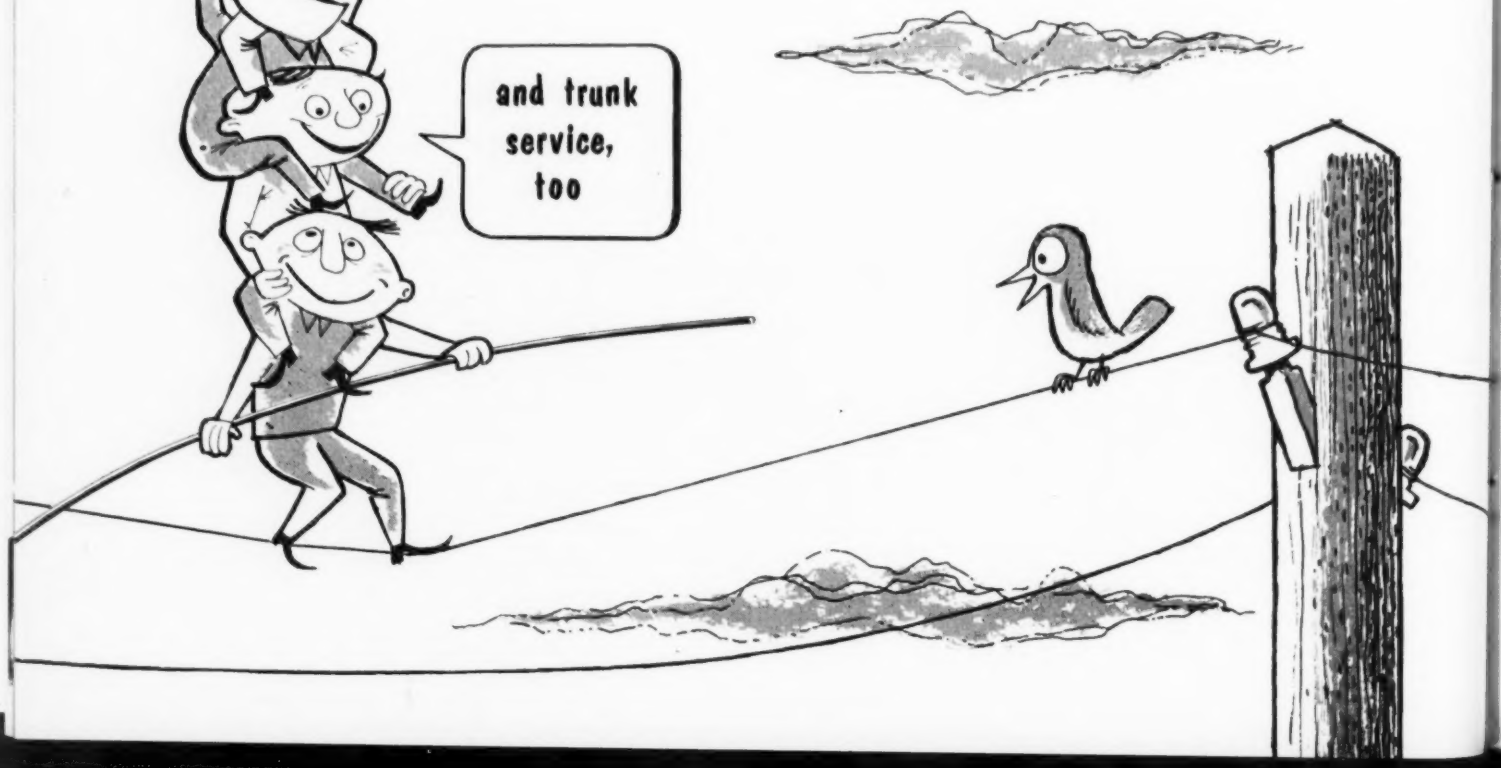

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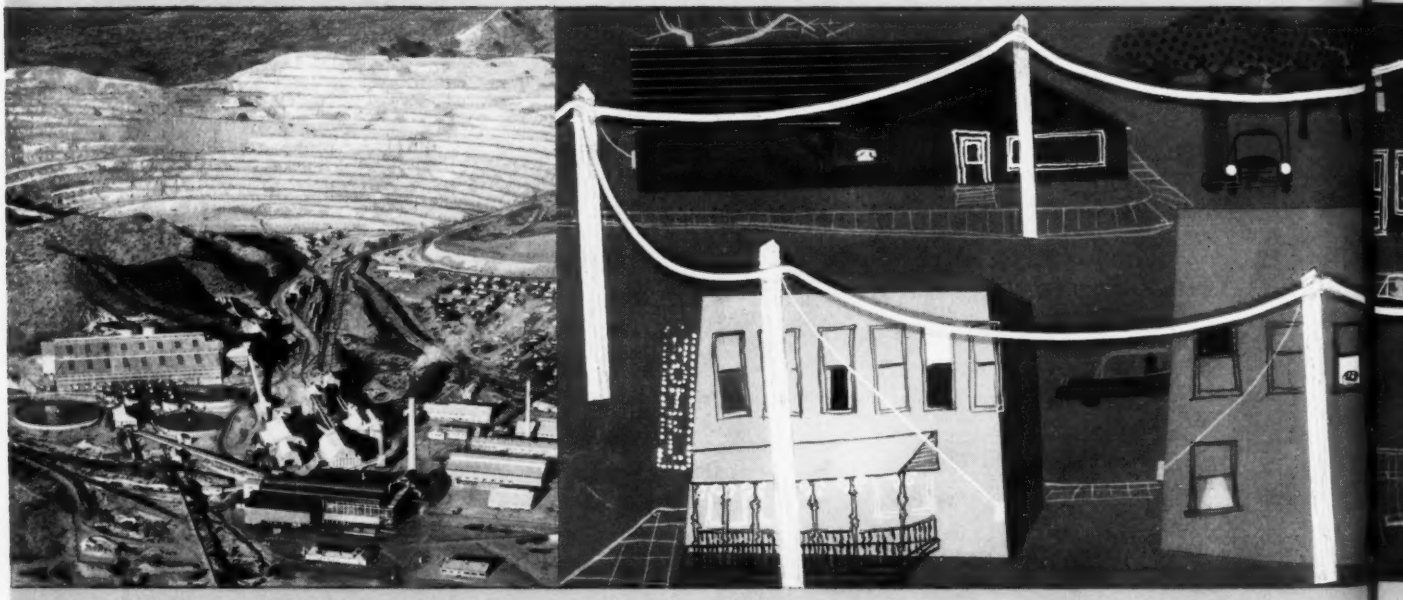

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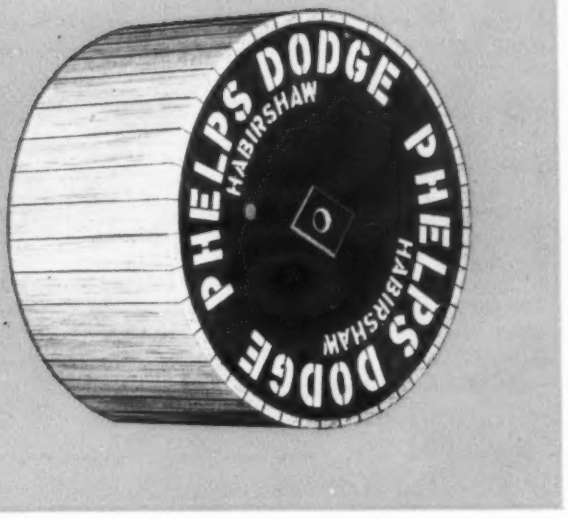

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FLASHES AND PLUGS

TELEPHONE HOUR, NAVAJO STYLE. The "telephone hour" is a TV program in some quarters, but not at the government school for Indians at Chilocco, Okla., relates the *Denver Post*. For the Navajo children from hogans in Arizona and New Mexico, it's a classroom period wherein they learn to use Alexander Graham Bell's invention. They receive instruction also in the use of many other gadgets foreign to their lives such as electric lights, sewing and washing machines, bathroom showers, workshop appliances, even clocks. No displaced European on arrival in the United States could be confronted with more bewilderment over the conveniences of an abundant economy, it seems, than are these Indian children.

In this Oklahoma school, there are more than 500 Navajo youngsters, ranging in age from 12 to 16. Although most of them have never been off the reservation before, they seem to take to their new environment like the proverbial duck to water, and don't want to go home when school closes in the summer.

The gap between life on the reservation and the school is bridged for the children by a Navajo named Bob Begay and a squad of interpreters. Begay, 27, a World War II Navy veteran, is himself a graduate of Chilocco, and on its behalf, travels during the summer from hogan to hogan, showing photographs and explaining to Indian parents the advantages the school offers their children.

One of the popular courses among the girls is cosmetology, requiring 1,000 hours. The girls also favor waitress and hospital aide training.

The boys largely go for automotive mechanics and the building trades. Many become expert drivers, examined and licensed by the Oklahoma state highway patrol.

All pupils get several years of basic instruction in English, are taught how to use currency, and have their own bank where they make deposits and withdrawals.

The caravan of busses to Chilocco each fall contains 11 vehicles, but the movement back to the reservation in the spring requires only nine. The reason? Another group of graduates has found work in Oklahoma and Kansas.

•

WIRED FOR SOUND. A couple of sheriff's deputies parked on a residential side street in Dallas, Tex., did some quick checking when they heard a murder being plotted over their police radio. Investigation developed the following:

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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

February 23, 1957

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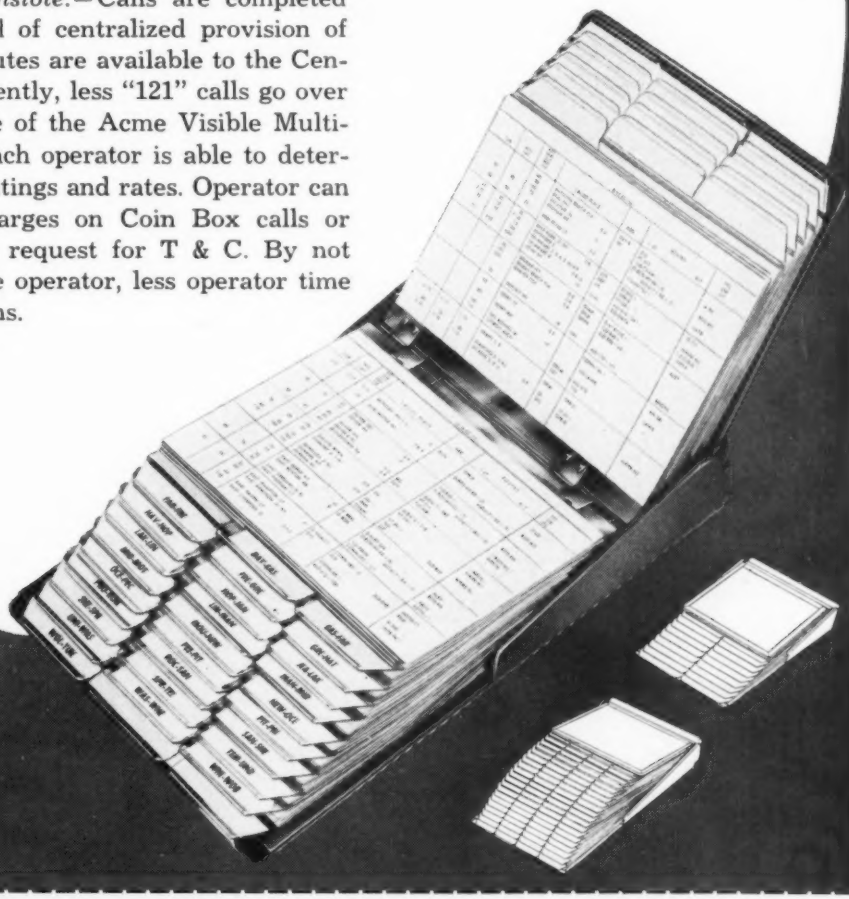

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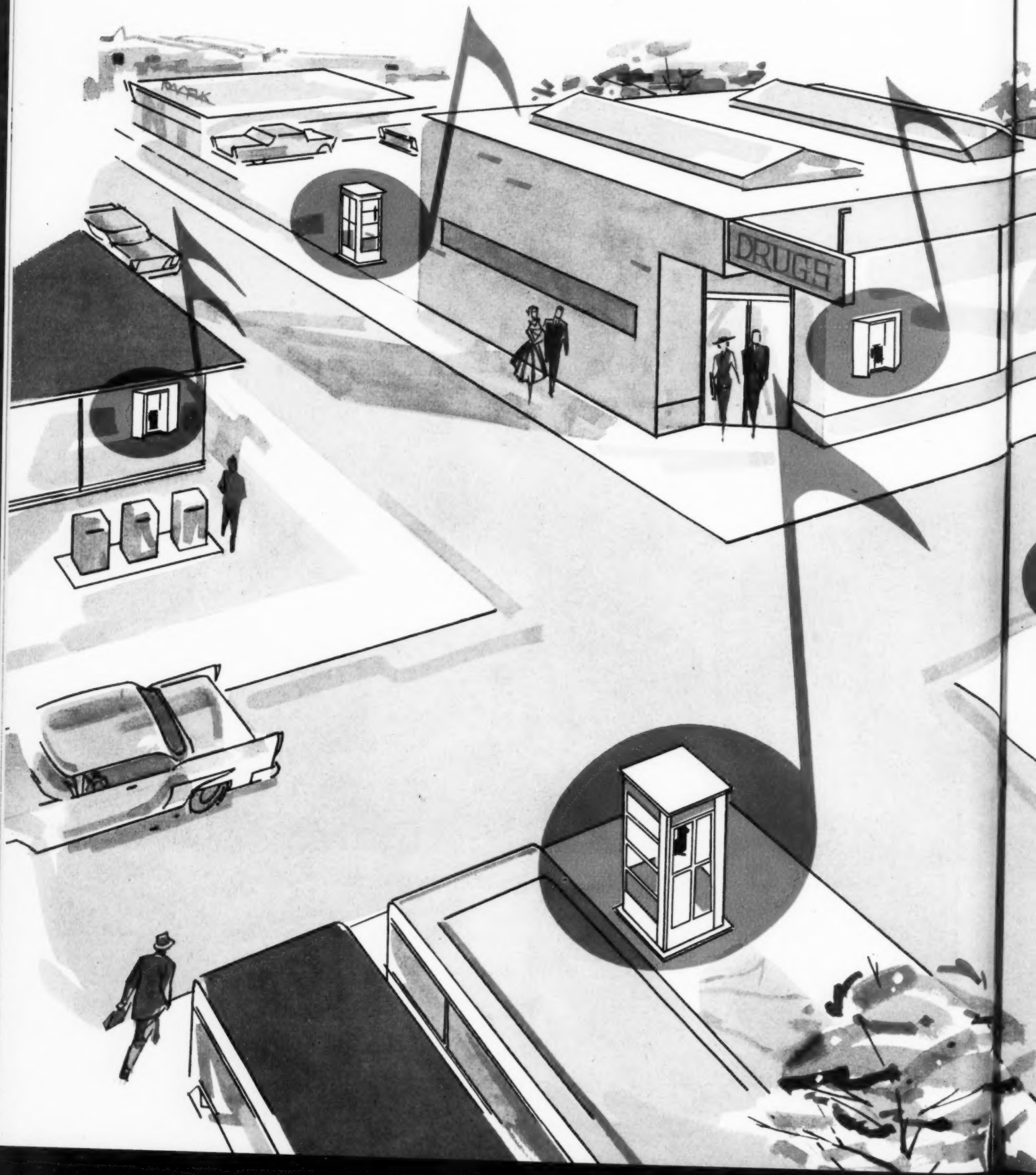

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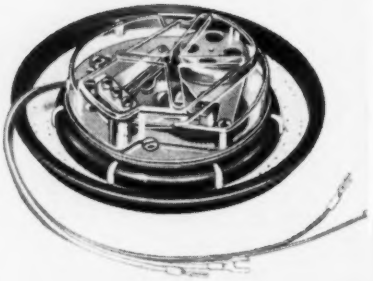

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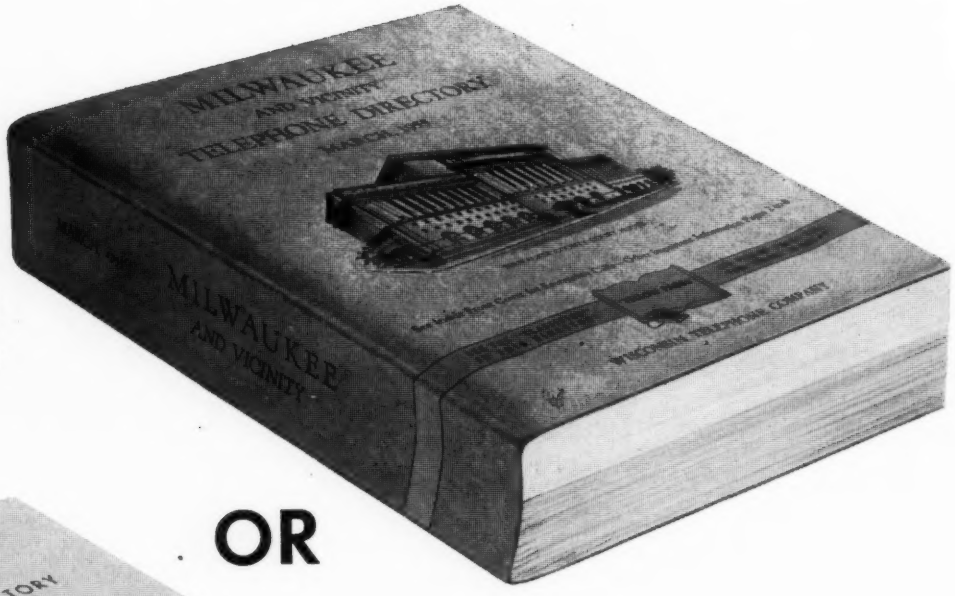

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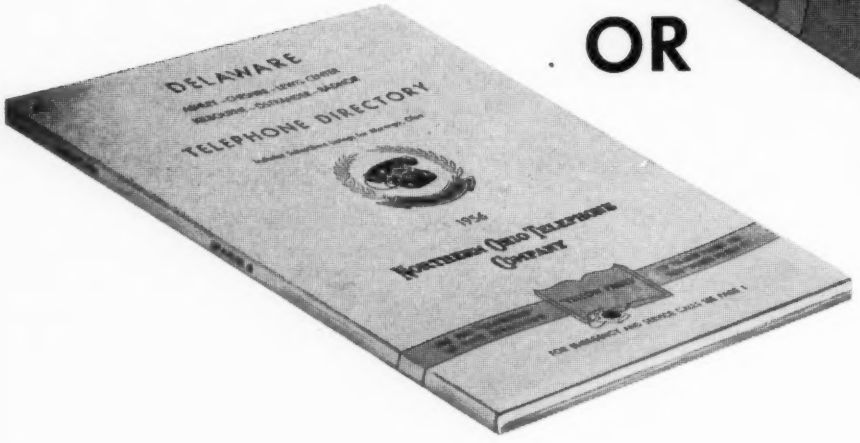

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IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR

Three bills introduced in Congress to repeal the 750-station exchange operators' wage exemption. Question of what effect a low original cost rate base has on employe pay raises is considered by New York commission counsel. Federal commercial activities to be reviewed. Final Hush-A-Phone action and bill to raise REA interest also in the news.

SENATOR MORSE, the Oregon Democrat, kicked off the drive of the telephone labor union people to repeal the small telephone exchange operators' wage exemption. On Feb. 11, Morse introduced a bill in the U. S. Senate which would specifically repeal the present exemption in the Fair Labor Standards Act of telephone operators' wages at exchanges having 750 stations or less. Morse's bill (S. 1178) was referred to the Senate Labor Committee.

At the same time, two similar bills were introduced over in the House of Representatives. One of these was sponsored by Representative James Roosevelt (D., Cal.), who seems to be developing into the most articulate critic of the telephone industry in the lower House. Roosevelt's bill (H. R. 4696) would likewise repeal the small exchange operators' exemption by expressed language.

Still another bill which would have the same net effect is a measure (H. R. 4575), sponsored by Representative Kelley (D., Pa.), in which the small exchange operators' wage exemption would be repealed only by reference to the section number and subdivision of the present law—along with the removal of various other exemptions by sections.

In other words, the Kelley Bill is a broader bill. And it is probably backed by organized labor union forces in carrying out some different program for amending and extending the Fair Labor Standards Act. Roosevelt's bill, on the other hand, and Senator Morse's bill in the Senate are aimed distinctly at the telephone industry.

What are the chances? As between the three bills the Kelley Bill is likely to have more steam behind it because Representative Kelley is the ranking majority member of the House Labor Committee. "Jimmy" Roosevelt, on the other hand, is pretty far down the totem pole on the House committee.

With the Senate preoccupied in foreign policy debate and likely to be further tangled up in civil rights and school aid legislation, one might ordinarily expect that labor bills would get first attention in the House. But this does not follow. The House committee is headed by Representative Graham A. Barden (D., N. C.), who has been most deliberate in handling amendments to change the Wage-Hour Law in past years.

As far as actual chances of repealing the small exchange exemption are concerned—the biggest obstacle to adoption would appear to be in the form of delay in committee. If these bills should get out of committee onto the floor of Congress, favorable action is indicated.

In other words, the telephone industry faces a hard fight when it tries to retain the small exchange wage exemption for another year. It can be done, of course. It has been done in former years when the threat of repealing the exemption seemed equally strong. Resistance would appear to depend on mobilization of support for the telephone industry's position in the congressional labor committees.

Wage versus Rate Increase

Does the fact that a regulatory commission using a low original cost rate base, instead of a higher replacement value rate base, affect the opportunities or chances of telephone employes to get pay raises? The counsel for the New York Public Service Commission says that there is no connection.

Apparently the employes of the New York Telephone Co. have their doubts. And in this writer's humble opinion, they have good reasons for such doubts.

This unusual question came up during the consideration of a bill pending, at this writing, before the New York legislature. This bill would repeal or nullify a decision by the New York court of appeals requiring that the New York commission use replacement value instead of original cost as a rate base for telephone companies in that state. It is significant that the almost unanimous opposition of telephone employes furnishes the principal roadblock for Governor Harriman's nullification bill. These employes are afraid that if such a bill becomes law, the New York Telephone Co. will not get a sufficient rate increase to take care of payroll increases in the future.

In seeking to dispel such employe opposition to the nullification bill, Kent H. Brown, counsel for the New York Public Service Commission, resorts to a rather ingenious argument. In a letter to Peter J. McCall, secretary of the United Telephone Organizations, which represents 20,000 employes, Brown says there is no foundation for any fear that the bill would adversely affect employe pay if it becomes law.

To justify this statement, he points out that payroll expense is one of the normal utility operating expenses. And

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since operating expenses are deducted from revenues *before* the telephone company's return is even computed, the basis for subsequently computing the return (that is, company profits) would be immaterial, as far as the employes are concerned. In other words, only the telephone company's owners (investors) would be affected by a shift in the rate base (from replacement value to original cost) upon which the return is determined.

Aside from the implied suggestion that the employes ought to take no heed whatever about what happens to the utility investor, Counsel Brown's argument is more clever than demonstrably sound. To set forth this argument in his own words, here is just what Mr. Brown said in his letter to Mr. McCall:

"No matter what basis is used for determining a reasonable telephone company 'return,' this in no way affects the employes whose wages and salaries are items of operating expense which must be covered in full before you reach the point of determining how much, over and above such expense, should be allowed for the stockholders and other investors in the company.

"Specific illustration of this is demonstrated by the New York Telephone 'interim' rate case of 1956. Following renegotiation of the collective bargaining contract with its employes in March of 1956, the company moved before the public service commission for a rate increase of 15 million dollars, basing its case entirely upon increased operating expenses which were occasioned, for the most part, by that revised wage increase.

"Since these were actual and reasonable operating expense increases, obviously rates had to be increased to compensate for them. The rates were so increased."

This kind of argument conveniently overlooks two very important factors, both essential to the welfare of telephone company employes. First, there is the matter of job opportunities. If the New York Telephone Co. is denied a proposed 55.4-million-dollar rate increase, or any substantial part of it simply because one rate base is used rather than the other, it stands to reason that the company is not going to be able to attract new capital commitments for new plant expansion and development. At least such new capital will not be attracted to the same degree that a full rate increase would make possible. To that extent, therefore, new plant expansion would have to be curtailed. Jobs for new employes, promotions for old employes, and employe opportunities all around would also be correspondingly curtailed.

The second consideration, which might well be weighed in a situation of this kind, is the willingness and ability of a utility company management to meet wage increases where it has more leeway, in the form of rate increases. What Counsel Brown has outlined to Mr. McCall, in his letter about payroll expenses coming out of revenues before profits, is merely a recital of *mathematical* operations. What the employer actually wants to do about employe wages is something else.

There is no law in New York state or anywhere else which compels the telephone company to agree to wage increases, regardless of the amount of return allowed to the stockholders. Obviously, an employer with 55 million dollars additional in his pocket to take care of everybody (including employes, stockholders, and other expenses; notably, taxes) is going to be a lot easier to deal with at the wage bargaining table than an employer who has been cut off from all further hope of that additional revenue by a rate base formula.

To reduce Counsel Brown's argument to an absurdity, suppose the New York Public Service Commission allowed the New York Telephone Co. *no profit whatever!* Then it would not have to use any kind of a rate base. It would merely allow enough rates to take care of expenses, including existing payrolls.

But could it then be seriously argued that such a denial of profits would have no effect on the willingness of the company to take care of wage increases or even maintain existing wage levels? On the contrary the incentive would be destroyed for the telephone company to remain in business at all. Of course, such a complete denial of return would be unlawful and the commission would not be allowed by the courts to take such unfair and arbitrary action.

(Please turn to page 70)

REA Makes Loans in Three States

Telephone loans of $686,000 to borrowers in Louisiana, Minnesota and Texas have been approved, the U. S. Department of Agriculture announced on Feb. 12. The funds will bring modern dial service to 723 new subscribers in rural sections of the three states. Service will be improved for 931 present subscribers. Details of the loans follow:

Johnson Telephone Co., Remer, Minn.; $232,000, first loan, (Feb. 6).

The borrower will use these funds to provide service for the first time to 95 farm families now without telephones, and to improve service for 237 existing subscribers and 90 switchers. At present the Johnson company is furnishing common battery service over 142 miles of line.

New construction proposed by the borrower includes an automatic central office at Remer.

Gilroy G. Arvig is president and Earnest V. Johnson is manager of the Johnson Telephone Co.

*

Brazoria (Tex.) Telephone Co.; $395,000, first loan, (Feb. 6).

The borrower will use these funds to furnish service for the first time to 585 farm families, and to improve facilities to serve its 604 present subscribers.

New construction planned includes expanded facilities in the Brazoria automatic central office. A portion of this loan will also be used to refinance existing indebtedness of the borrower.

Charles A. Hendrix is president of the Brazoria Telephone Co.

*

Northeast Louisiana Telephone Co., Collinston, La.; $59,000, second loan, (Feb. 7).

The borrower plans to use this loan to furnish dial service to 43 rural families who were not provided for in the first loan. A portion of the loan funds will be used to complete construction authorized under the original loan to the Northeast Louisiana company.

The two REA loans totaling $229,000 will make possible new and improved service to 498 subscribers in Morehouse parish.

Ben W. Hopgood is president and manager of the Northeast Louisiana Telephone Co.

today's

Highlights

of finance-taxes-business trends

by Willard F. Stanley

"BOND YIELDS RESCUED—MARINES ARRIVE IN NICK OF TIME"—That could have been the headline for developments during the last 30 days in the markets for utility funded debt—provided we still wrote that way and if the Marines had anything to do with it. Bond prices did continue their rally from the excessive depression of the first 10 days of January, and moderately better yields for new utility funded debt offerings—from the issuers' standpoint—have continued since our last report.

Just as this is written, Potomac Electric debentures were offered on a 4.45 per cent basis. This is a Moody's "A" rated security and reflects a yield 11 decimals (.11 per cent per annum) better (i.e., lower) than similar yields for any of the four "A" rated bond issues offered by electric utilities in December or January. This reduction in yield on a new offering is confirmed by action of the market for recent utility debt securities. Twelve such new issues tabulated in the Wall St. Journal, showed, at Feb. 12, a lowering of average yields on the basis of bids compared with original offering prices, of nearly 13 decimals (.13 per cent per annum).

Does this presage still lower yields for utility funded debt in the near future? We doubt if the rally will progress much further. Happier feelings pervade the minds of bidders for competitive issues and negotiators for non-competitive offerings. Also some easing of short-term money rates has been experienced, notably a drop to nearly 3 per cent in yields on U. S. treasury bills.

But early in February a tally of offerings scheduled for that month and March showed a large demand for funds, with utilities planning some 220 million dollars of funded debt in the earlier month and around 425 million dollars in March (including the AT&T issue, which on this occasion, must be considered as funded debt, since it is expected the debentures will not be convertible). There was then scheduled, in addition, some 320 million dollars of new February offerings of funded debt by issuers other than utilities, bringing the total for that month to 550 million dollars. No industrial issues were then scheduled for March, but these companies customarily are slow to announce financial plans and no doubt substantial amounts of these funded debt offerings will be brought to market ultimately in that month. All this excludes the substantial amounts being placed privately, principally by industrial companies willing to waive redemption rights for 10 years.

Recently released comparison of last year's funded debt offerings with those for 1955 showed a small decrease in utility offerings, both in funded debt and in all categories of securities. So it is evident the market pressure in senior securities during 1956 was caused by increase in demands of industrial companies

Mr. Stanley, formerly financial vice president of Southwestern Public Service Co., an electric utility with over 160 million dollars in assets, is president of Corporate Services, Inc. of New York City. He is a member of Controllers Institute of America and New York Society of Security Analysts. He serves on three committees of the Controllers Institute having to do with federal taxation, social security and finance management. His articles are appearing once a month in TELEPHONY.

requiring funds to finance unprecedented expansion. Also, this type of borrower, unrestricted by competitive bidding requirements, turned increasingly to private placements.

A minority of expert opinion believes that by mid-1957 there may be a softening of interest rates. But to predict this timing requires the expert services of several crystal balls operated by a happy medium.

We have hitherto stressed that the historically high plateau recently set by utility bond yields indicates that with operation of the law of averages, there should ultimately be greater chance for lowering of yields. But the downward rebound from the high yields of early January has now proceeded to a point where we would be inclined to take advantage of relatively favorable current yield conditions by selling promptly funded debt and other senior securities to provide funds likely to be needed during several months to come. Further declines in bond yields may occur, but in the absence of new and impressive evidence we incline to the view that on a short-term basis taking the cash and letting the credit go may prove a desirable maxim. Certainly we would not now suggest any lengthy deferral of normal schedules for utility senior security offerings to raise funds for current expansion.

* * * *

AGAIN: COMMON STOCK EQUITIES—It's hardly necessary to reiterate our somewhat monotonous recommendation that common stocks should be sold for funds of this type likely to be needed within the next year or even considerably longer. Utilities seem one of the most strongly situated industries in our economy of "creeping" inflation. But while high assurance of increasing earnings and dividends make these equities interesting to investors in many cases, we don't think issuers should hesitate to "gather their rosebuds while they may" and take advantage of historically low yields and favorable market conditions for utility equity sales.

* * * *

STOCK MARKET CRACKS A BIT—After the see-saw of several months, February saw a continuation of the January decline, sufficient to crack the averages a bit at the seams. The downward plunge has seemed rather drastic for the greater part of several weeks. Very recent moderate rallies, as this is written, have by no means recovered the loss in the "averages" of the past 30 days. Our New York Times combined 50-stock average, to which we have been steadfastly adhering, registered a 4 per cent decline at Jan. 20 versus last year end; at Feb. 15 this decline increased to something like 6 per cent below Dec. 31, 1956. International uncertainties can hardly be blamed. More important as a depressive factor seems the fear of deflation of profits along with the creeping inflation of prices. As mentioned in prior columns, profit margins are being squeezed in many industries and fear arises that prosperity may prove profitless corporatewise from here on. Recent easing of money rates has taken a little pressure off equities from the standpoint of comparative yields and we are still inclined to the view that relatively stable market averages are likely to prevail for the next several months.

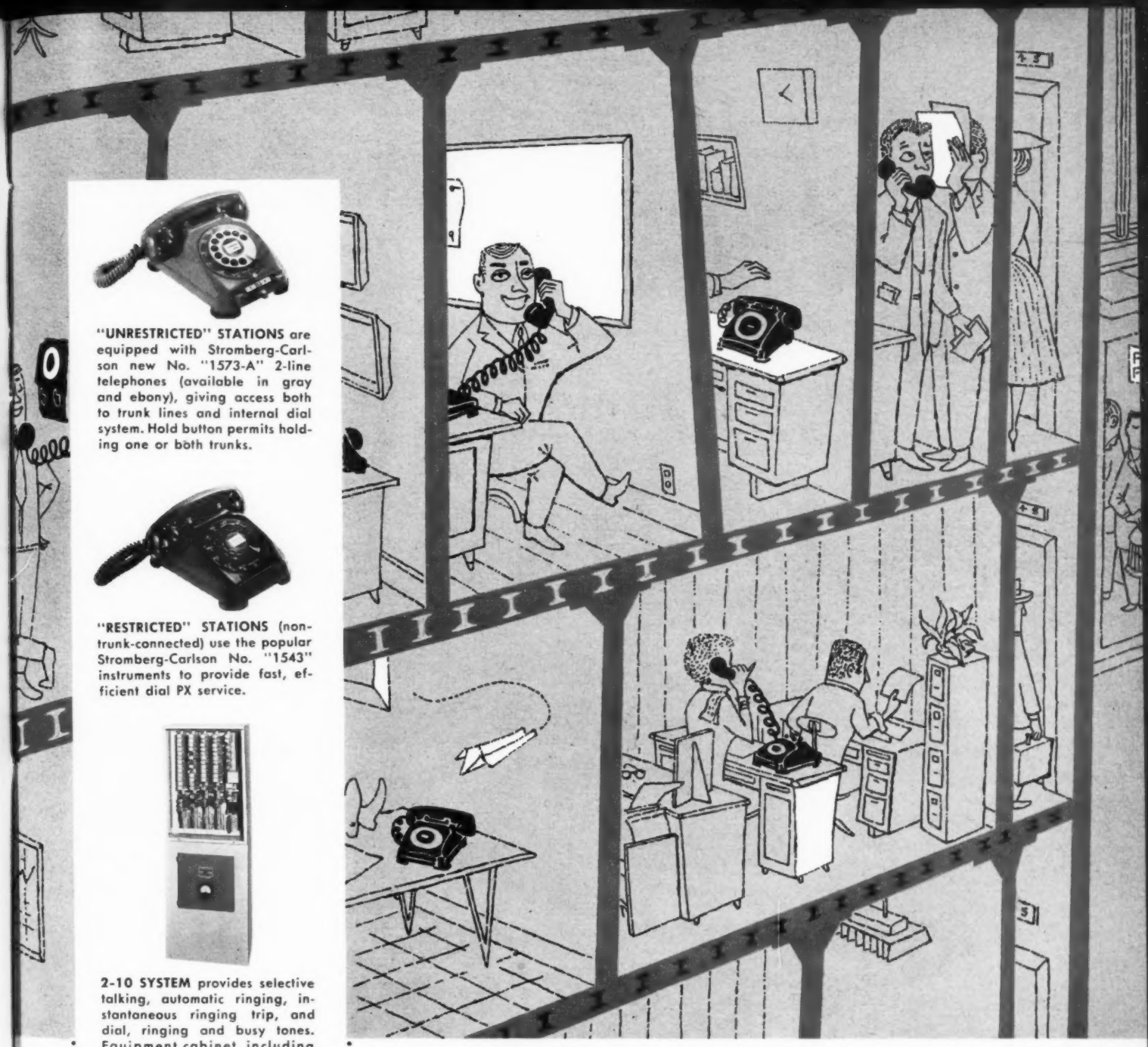
* * * *

FEDERAL TAXES—During 1956 there were some interesting developments in various phases of income tax matters resulting from decisions of the Tax Court, the District Court or treasury regulations. Among these were:

A holding that if a company pays personal expenses of a majority stockholder, this payment is taxable to the stockholder as income. Another, to the effect that if a company should buy a building which has already been fully depreciated the purchasing company may, nevertheless, deduct what it paid as depreciation over the estimated remaining life.

Also, if a company lays off an employe and remits jobless pay, the company may deduct such payments and the employe must report them as income, but the company need not withhold the federal income tax on these payments.

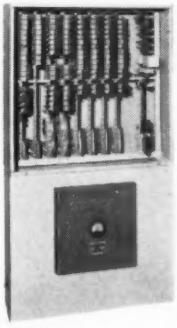
Other such decisions will be mentioned briefly in the subsequent report on this subject.



"UNRESTRICTED" STATIONS are equipped with Stromberg-Carlson new No. "1573-A" 2-line telephones (available in gray and ebony), giving access both to trunk lines and internal dial system. Hold button permits holding one or both trunks.

"RESTRICTED" STATIONS (non-trunk-connected) use the popular Stromberg-Carlson No. "1543" instruments to provide fast, efficient dial PX service.

2-10 SYSTEM provides selective talking, automatic ringing, instantaneous ringing trip, and dial, ringing and busy tones. Equipment cabinet, including battery eliminator, is 53½" high, 18¼" wide, 10⅛" deep. *Capacity is 2 simultaneous talking paths, 10 lines, up to 30 telephones, including extensions.*



4-20 SYSTEM offers the same features as the 2-10. Equipment cabinet, including battery eliminator, is 59" high, 32" wide, 10⅛" deep. *Capacity is 4 simultaneous talking paths, 20 lines, up to 60 telephones, including extensions.*

Here's dial PBX service
for your smaller business subscribers

You can give your commercial revenue a powerful boost with the Stromberg-Carlson 2-10 and 4-20 dial PBX systems.

These unattended systems are ideal for business and institutional subscribers which are growing too big for their present equipment, but do not need large systems. Small factories, banks, regional insurance offices and large law offices are but a few of your potential customers for a 2-10 or 4-20.

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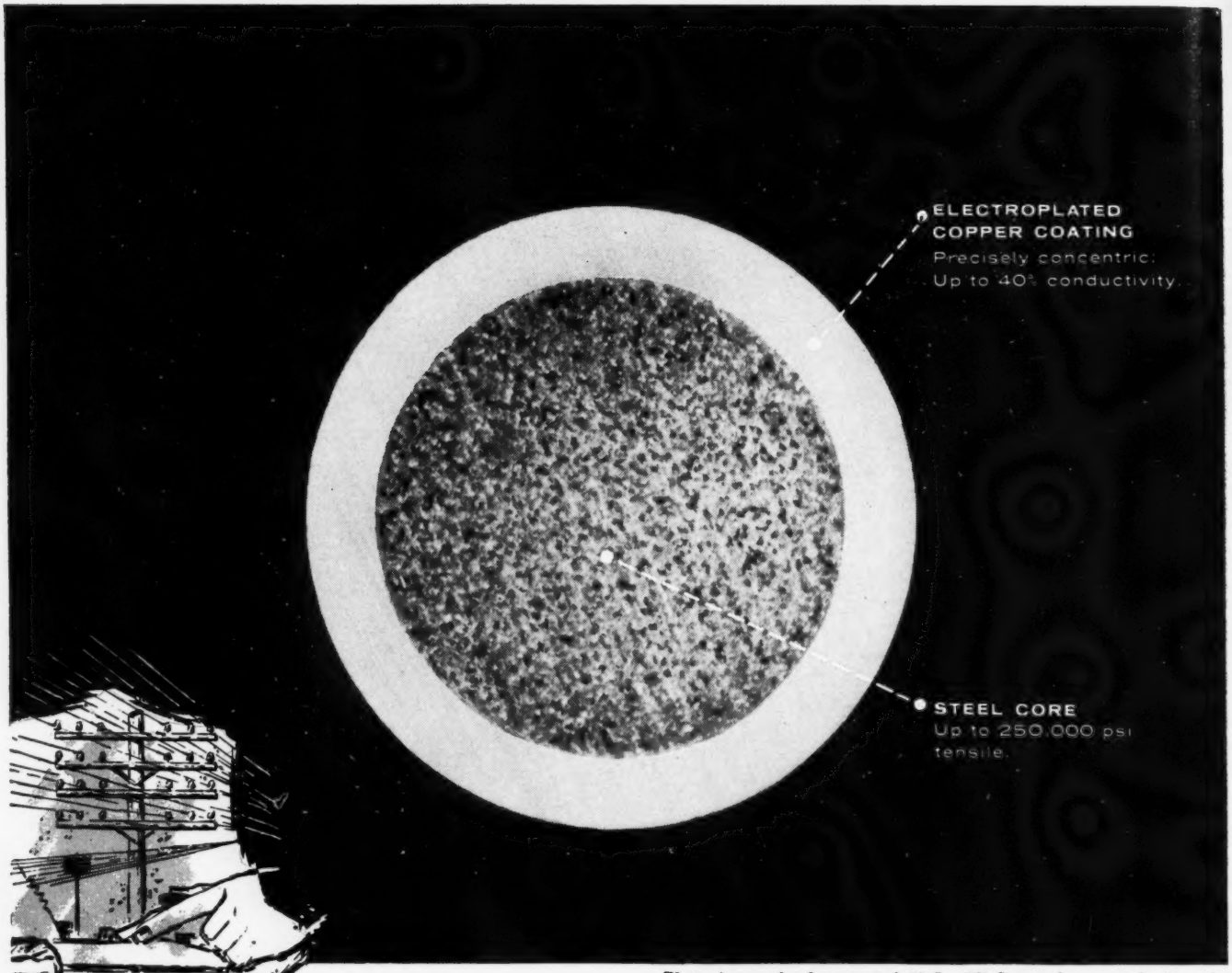

Photomicrograph enlargement of .104"—40% Copperply communications wire

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DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; *tire wire, stainless, music spring and plated wires* • **WORCESTER WIRE WORKS, Worcester, Mass.;** *high and low carbon specialty wires* **WAGNER LITHO MACHINERY, Secaucus, N. J.;** *metal decorating equipment* • **ATHENIA STEEL, Clifton, N. J.;** *flat, high carbon spring steels* • **REYNOLDS WIRE, Dixon, Ill.;** *industrial wire cloth*

XUM

PULSE SYSTEM FOR SUBSCRIBER LINES

THE TIME division multiplex system of microwave transmission, otherwise known as pulse time modulation may have a similar application on subscriber telephone lines. Patent No. 2,765,357 issued to John H. Homrighous of Oak Park, Ill., describes a method whereby this technique can be used to give private line service to a number of parties on the same line.

The invention also has the advantage that no special equipment is needed for ringing bells. Regular 20-cycle or harmonic ringers can be used right over the voice path of the system, without the use of special ringer relays or by-pass circuits. Further, common battery direct current for talking purposes can be supplied over the line. The station equipment can be operated from batteries or a power supply.

Each party on the line would have his telephone equipped with an amplifier, a pulse delay line and an electronic gate. These circuits are somewhat strange to many telephone men, but they have seen wide application in the radar, microwave and computer fields. Circuits with similar properties will be required for electronic switching.

This circuit is interesting not only because it suggests things which may someday come to the telephone business, but also because it is an easy way to learn about pulse and gate circuits. Because it is hooked to an ordinary telephone line instead of a microwave or data processing machine, this circuit is an easy introduction for telephone men who are interested in electronic techniques.

In the station set diagram, *Fig. 1*, the regular subset, complete with ringer is connected to the line, but one side is detoured through tube V3, which is an electronic gate. At the moment, this gate is open-circuited, non-conducting, as far as the line is concerned. While the patent papers do not give values or describe the operation of this part of the circuit, the tube would ordinarily be made non-conducting by biasing the grids sufficiently negative to cause cut-off of the plate current flow. Note that one of the cathodes of this tube is connected to line 1, hence any potential on the line will affect the bias on the tube.

Notice, also, that the plate on one side of the tube is connected to the cathode on the other side and vice versa. This means that when this tube does conduct, later, it will conduct in both directions. Therefore, it will pass direct current, ringing current and speech current. This switch, or electronic gate, acts just like a relay contact, but needs no winding or moving parts.

A line equipped with this system will have pulses traveling along it which are supplied from the central office by a circuit which will be shown later. Each time a pulse arrives at L2, it goes into the grid of

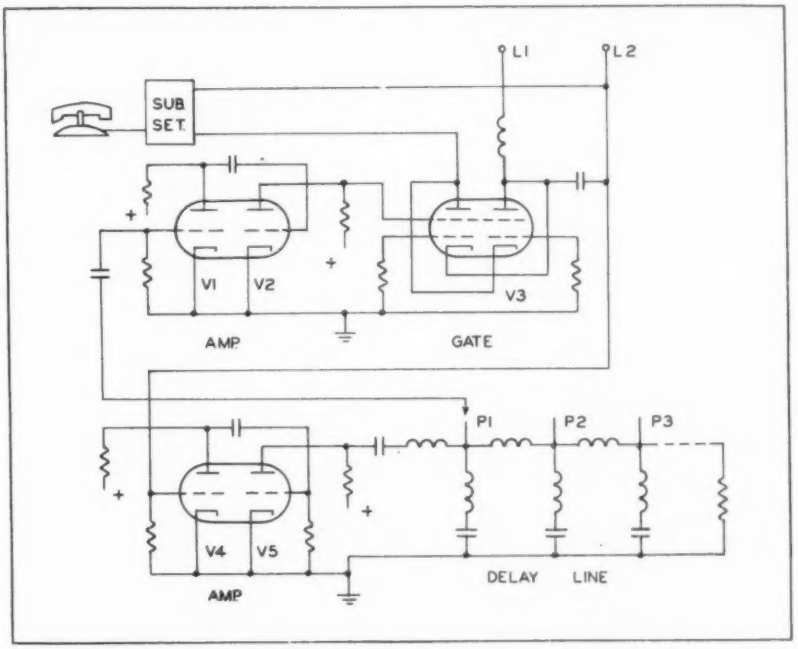

Fig. 1. When a pulse enters this system at L2 it is amplified by V4 and V5 and sent into the delay line. This puts out pulses in succession at P1, P2, P3. The jumper from the grid of V1 is connected to one of these points, depending on which party this is. The pulse, every time it comes around, closes the telephone to the line through the electronic gate, V3.

tube V4 and is amplified. As the pulse comes out at the plate of this tube it passes through a capacitor and enters the grid of tube V5 where it is amplified again.

DELAY LINE

The pulse then travels along the delay line, which is composed of a number of shunt and series coils and capacitors. This slows the pulses down. Instead of traveling with the speed of light, the current must buck the choking action of each coil, and charge each condenser, before it can go on to the next.

This means that the original pulse, as it fights its way through this network will appear a little later at P2 than it does at P1, and later at P3 than at P2. This electronic delay line, then, works much like a distributor in an automobile; pulses of voltage appear at P1, P2, P3, and more points if needed. Each pulse comes at a slightly different time than the others; no two points have the pulse at the same time.

This principle can be used to key or trigger different parties on the line. If one party was connected to P1 on his delay line, he could talk every time a pulse appeared at P1. Another party on the line could be connected to P2 on his own delay line, and another to P3, and so on. Thus, one party after another would use the line for a few millionths of a second at a time. Each subscriber would have identical equipment. This would enable many people to use the line without interfering with each other. The speed at which the pulse system would switch from one to the other would be so fast that it would not interference with the conversations.

In this invention the switching is accomplished by connecting the arrow to P1, or P2 or P3 etc., depending on which party this one is. When a pulse appears at P1, if the wire with the arrow is connected here, the pulse will travel up to the grid of tube V1. From the plate, it will go through a condenser to the grid of V2 where it will be amplified again. The pulse is then applied to the second grid of tube V3, which, you will remember has been non-conducting up until now. When the pulse hits this grid, the tube instantly conducts for the duration of the pulse.

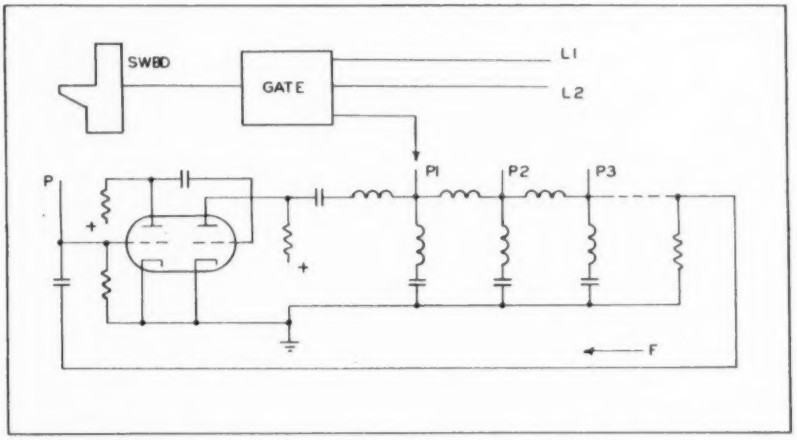

Fig. 2. The central office end of the pulsed telephone system is the same as the station end, with the exception of the feedback wire F, which takes the pulse at the end of the delay line and sends it back into the beginning, thus making the pulse self-regenerating once it is started. Each point (P1, P2, etc.) would connect to a separate jack corresponding to the telephone which was connected to the corresponding point P1, P2 etc. at the station end. The circuit for the gate shown above is the same as that shown in Figure 1. Drawings by Victor Willard.

During that instant anything that is on the line—battery, ringing power or speech, is closed from L2 through V3 into the subset. The next instant, as the pulse reaches P2, the tube V3 at this party station opens the circuit to this telephone again. However, the second party on the line, which will have its arrow connected to P2 on his own delay line, will suddenly come to life and be connected to the line for a fraction of a second.

In order to make this all work out and keep from scrambling things, it is necessary that the central office end of the line have similar gating equipment, which, if in a manual office, will connect party No. 1 to jack No. 1 and party No. 2 to jack No. 2, etc.

The circuit for the office, then, is practically identical to the one shown for the station. The main difference is that the gate circuit would be connected to a switchboard or selector instead of a telephone.

PULSE GENERATOR

An additional feature of the central office end of this circuit is that the delay line is also made to function as a pulse generator. *Fig. 2* shows how this is done. The delay line works as described above. If a single pulse of positive voltage is put into the circuit at the point P, it will be amplified by the two tubes, and travel down the delay line, putting out pulses, one after the other at points P1, P2 and P3, etc. Note, however, that in this case, when the pulse reaches the end of the line it is fed back through wire F into the input end of the circuit. Whenever this is done electronically, if the phase is right, a recurring automatic condition results. When this

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is done with a tube and resonant circuit alone, oscillation results.

In this case, a repeating pulse results. The pulse continues to make the round trip, sending out timed intervals at P1, P2, etc.

The arrow above P1 would be connected between P1 and a gate circuit which would go to a jack on the switchboard which would correspond to the party whose telephone was also connected to P1 on the delay line at the station. Another jumper would connect P2 to another gate and jack which would correspond to the telephone which had its station jumper on P2, etc.

Thus, when the pulse reached P2 in both the office and the station, party 2 would be connected to his jack. When the pulse reached P3, party three would be connected up to his jack. Actually, only one party would really be using the line at a time, but this circuit would switch rapidly from one party to the other at both the station and the switchboard end, and several conversations could go on at once.

This kind of a circuit can find many applications. If the time delay is great enough, it can carry a string of pulses which might be coded to carry information. This train of pulses might be circulated round 'n round for as long as you wish. It would thus become a memory or storage circuit. In a computer, it might store one the total of one column of numbers temporarily while waiting for another factor to be developed elsewhere.

In this case, however, the simple circuit shown merely keeps repeating the pulse that started it, and goes on silently switching from one telephone to another, thousands of times per second.

The patent described here does not assign specific rates, but pulse techniques in the past have usually required a repetition rate which was twice the rate of the highest frequency to be transmitted. Thus, a 3,500-cycle telephone channel would require at least a 7,000 times per second pulse rate in order to pass unnoticed by the talkers.

In order for a 20-cycle bell to ring when called with this system, the tubes at the station would have to be turned on at all times. If the station must be battery operated, a harmonic ringer can be connected direct to the line. The tubes then need only be turned on while talking. This can be done by a contact in the hookswitch.

The drawings and description given here are a modification and simplification of the original patent. The complete invention includes features for calling parties on one's same line, busy line protection and other items.

ELECTRONICS AND ENGINEERING

ELECTRONICS is taking over electrical engineering education, according to Dr. Frederick E. Terman, dean of the Engineering School and provost at Stanford University. In an article in a recent issue of Proceedings of the IRE, he declared that prewar electrical engineering, which concentrated on the 60-cycle power field, will be regarded as only a small part of electronic science. This will mean that the education of an electrical engineer will return to the field of pure science.

Oddly enough, the first training in electrical engineering ever taught in schools was given by the physics department. As the science developed, engineering training moved toward design procedures and away from basic science. Educators and employers alike believed that when a man received his B. S. degree, it was time for him to get out and start his practical experience.

As a result, Dr. Terman says, graduate training was not encouraged and little research was carried on in the universities. Electronics, then called radio or communication, became available as elective courses in the 1920's with the rise of radio. These were taught by young men with enthusiasm and a desire to experiment. These people began the move back towards science and away from handbook designs and standard methods.

This evolutionary process is continuing and electrical engineering is moving away from engineering as previously understood, and back to the sciences whence it came.

Electronics becomes constantly more complicated, Dr. Terman points out. A TV set is more complicated than a radio, color TV is still more complicated. Microwaves call for a greater knowledge of mathematics and physics than do broadcast wave lengths. Transistors have a higher level of sophistication than do vacuum tubes.

Electronics today is being developed by men who work side by side with physicists, mathematicians, chemists and metallurgists. These engineers must have training which emphasizes basic science, including such subjects as differential equations, functions of a complex variable, vector analysis, Laplace transform, matrix theory, theory of random process, physics, quantum mechanics and others.

All of this means, says Dr. Terman, that an able electronics engineer will not be able to achieve his full possibilities unless he acquires formal training beyond his bachelor's degree. This means graduate school, evening school or industrial training programs.

NEW THERMISTOR BRIDGE

AN IMPROVED bridge for measuring radio frequency has been developed by the National Bureau of Standards. The operation of the instrument is based upon the equivalent heating effect of rf and dc power when dissipated in a resistive load.

In the operation the bridge is balanced with dc flowing in the thermistor. The rf is then added, which unbalances the bridge. The dc power is then withdrawn until balance is restored. The power of the radio frequency can then be computed.

COMPUTER FOR AIR LINES

PASSENGER reservations on each of United Air Lines 300 daily flights will be recorded on magnetic discs in IBM Ramac computers. Ramac means Random Access Memory Accounting machine. The machines will be used at United's service center at Denver, where they will keep track of all flights for 100 days in advance.

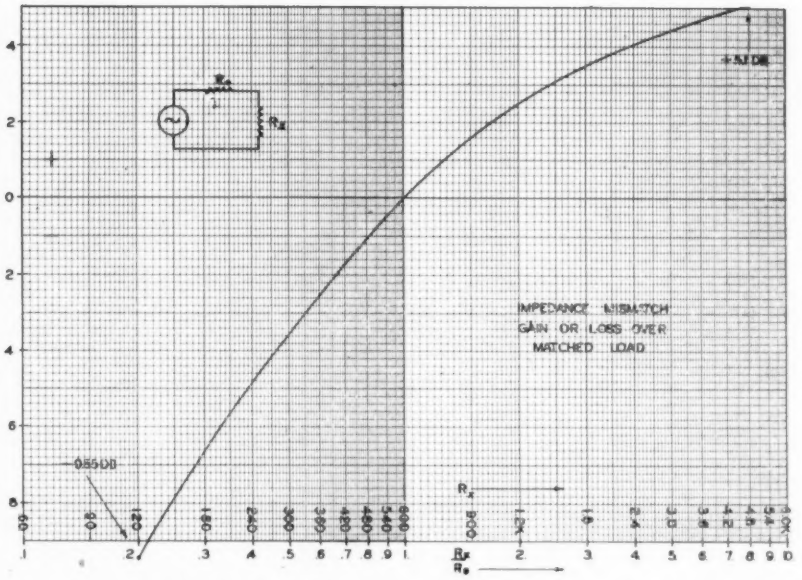
Five million bits of information can be stored on Ramac's 50 discs. Each disk has 100 recording tracks, each in turn capable of storing 1,000 character units.

In operation, reservations will be reported to the machine shortly after they are made, in any of the 80 cities in the system. Inquiry can be made to the machine as to the number of seats available on any flight, and Ramac will give the answer in less than one second. If all seats are taken, the machine will refuse to accept further reservations.

It is expected that the equipment will be delivered late this year.

ELECTRONICS NOW IN FILM INDUSTRY

THE television camera has joined forces with the motion picture camera in Hollywood. The DuMont Electroicam (trade mark) Film System is an assembly whereby a regular movie camera and a TV camera operating over a closed circuit see a scene through the same optical system. In addition to being photographed on film, TV monitors provide an electronic view finder for the camera man, and give the director and technical staff a camera's eye view of the scene. The complete system is installed in trailers so that it may be moved from set to set as required. The first Hollywood use will be at the Paramount-Sunset Studios.



PUT THIS CHART WITH YOUR DB METER. Sometimes it is necessary to use a decibel meter on a line which is a different impedance than 600 ohms. This chart shows the correction factor to apply when this is done. The actual line impedance is to be found in the figures along the bottom. The decibel correction is the column of figures at the left.—From an original chart drawn by E. H. B. Bartelink.

ELECTRONIC NOTES

THE G-Line, a new economical transmission line has been announced by Prodelin, Inc., of Kearny, N. J. Designed for applications which would otherwise require coaxial line or waveguides, the G-Line assembly consists of a modified copper wire coupled at each end with an rf field transformer.

The transformer is a conical, pointed device resembling a plumb-bob in appearance. It couples the radial field of the wire to the field of the feed line in antenna installations.

*

A SILICON diode which will handle 1000 volts peak inverse voltage is now available from International Rectifier Corp. of El Segundo, Cal. The diode occupies a volume of only 1/16 cubic inch and will operate at ambient temperatures as high as 150° C.

*

TWO NEW transistors, a Micro-Alloy Transistor (MAT) and a Surface Barrier Diffused Transistor (SBDT) are now being mass-produced by a new technique, according to the Philco Corp. The new method permits precision control of critical dimensions and avoids manual assembly of the parts.

XUM

The new transistors will be useful in the computer, communications, guided missile and ultra-high frequency fields.

*

AN ENGINEER, according to the Northern New Jersey IRE Newsletter, was once defined as a man who knew all the reasons why a new idea will not work. A new technique called "brainstorming" was recently demonstrated to the IRE members there by the Bell Telephone Laboratories.

Brainstorming is group discussion of a problem at which no negative idea is permitted.

*

A SERIES of tubes with a life expectancy of more than 10,000 hours has been announced by Ericsson of Sweden. The tubes are duo-triodes the 2C51/2C51L, 18C51 and 407A. They are highly resistant to shock and vibration. The tubes are handled here by State Labs, Inc., 649 Broadway, New York 12, N. Y.

*

NEARLY one million bits of information can be stored in a one-inch square glass plate memory device. Developed by a GE scientist, the glass has tiny holes etched into it. These holes are then filled with metal. Information is stored by a scanning electron beam, as in television. Information can be read out from the opposite side by another beam.

*

AUTOMATION is now used to test electronic components. The Electronic Control Systems, Inc., of Los Angeles, an affiliate of Stromberg-Carlson, uses an automatic hopper feed, sorter, tester, recorder and analyzer for axial lead components such as semi-conductor diodes.

The system tests and sorts the components for quality, makes a punched tape record of range, average and standard deviation of the parts.

*

A NOISE cancelling microphone has been developed for military airplane use. Extraneous noise is allowed to strike both sides of the diaphragm, thus cancelling out. The user's voice strikes only one side, so the unit responds to the difference in pressure.

HOW TO GET LICENSED

Technicians

for 2 way radio

...microwave

ALL TYPES OF ELECTRONIC EQUIPMENT

The basic requirement of an electronic technician is a thorough understanding of the fundamentals. The electronic devices being used by telephone companies demand technicians who "think electronics"!

This publication *Telephony* recently inaugurated a section devoted to electronics. This is graphic proof of the impact made by electronics on the telephone industry.

There is no need to hire new personnel . . . no need to lose valuable man hours by sending your employees to school. We will provide effective training for your present staff . . . at a moderate cost . . . and we guarantee the results.

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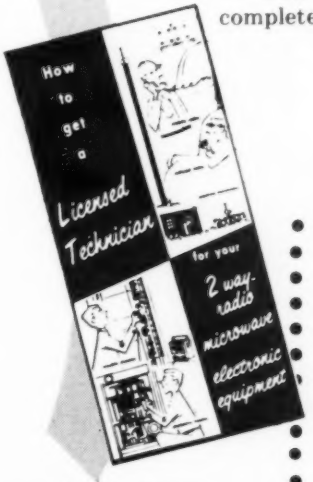

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ABC of the Telephone

by Frank E. Lee

PART 80. OUTSIDE PLANT CONSTRUCTION—Section 6, Guy Wires. Section 1 (TELEPHONY, Nov. 17, 1956) discussed planning of additions to the outside plant. Section 2 (TELEPHONY, Nov. 24, 1956) covered laying out the pole line, grading requirements and a résumé of clearances to be observed in outside plant construction. Section 3 (TELEPHONY, Dec. 1, 1956) was based on poles, their selection, treatment, handling, storage, and gaining. Section 4 (TELEPHONY, Dec. 8, 1956) showed how the use of power equipment can save construction time. Also included is information on the depth poles are set in various types of soil. Section 5 (TELEPHONY, Feb. 16) covered the purpose and proper placement of guy wires.

AN IMPORTANT point to remember when selecting a location for a guy wire is that the pull of a guy wire must be directly opposite the load it supports. This means the guy wire must be in line with the load. If the guy is out of line with the load the stress on the guy is unbalanced and its effectiveness is reduced correspondingly.

Dead-end Guy

The dead-end guy, shown in *Fig. 1*, is a good example of the importance of correct guy placement. The position of the guy wire with relation to the load is shown in the diagram of the pole. If the guy was placed out of line, either to the left or right, the pull on the pole would be similar to the pull on a corner pole.

Corner Guys

When the pull on a corner pole is greater than the maximum allowed for an unguyed pole a corner guy should be used. In this case, the guy anchor is generally placed so that it bisects the angle formed by the line wire at the corner pole. The location of a guy wire that bisects a corner angle is shown in *Fig. 2*.

The reason for placing the guy wire in this position is quite apparent because it is directly opposite a line that would be drawn to indicate the direction of pull on the pole, as discussed previously. If the guy were out of line with the pull, to the right or left, as shown by the dotted lines, an unbalanced stress situation would result similar to an improperly positioned dead end guy.

When a pole line is supporting a heavy load of wires or cable the pull at a corner pole may be large enough to require the use of two guy wires to support the load. Whenever space permits, each guy wire should dead-end one leg of the line load, as shown in

(Please turn to page 32)

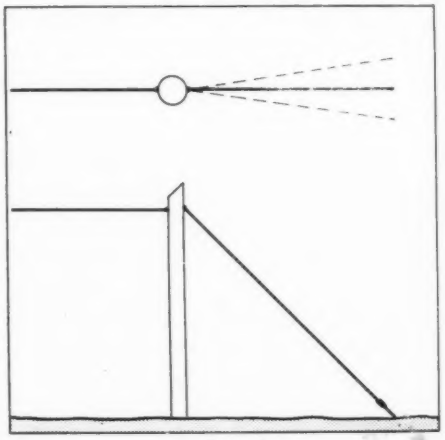

Fig. 1

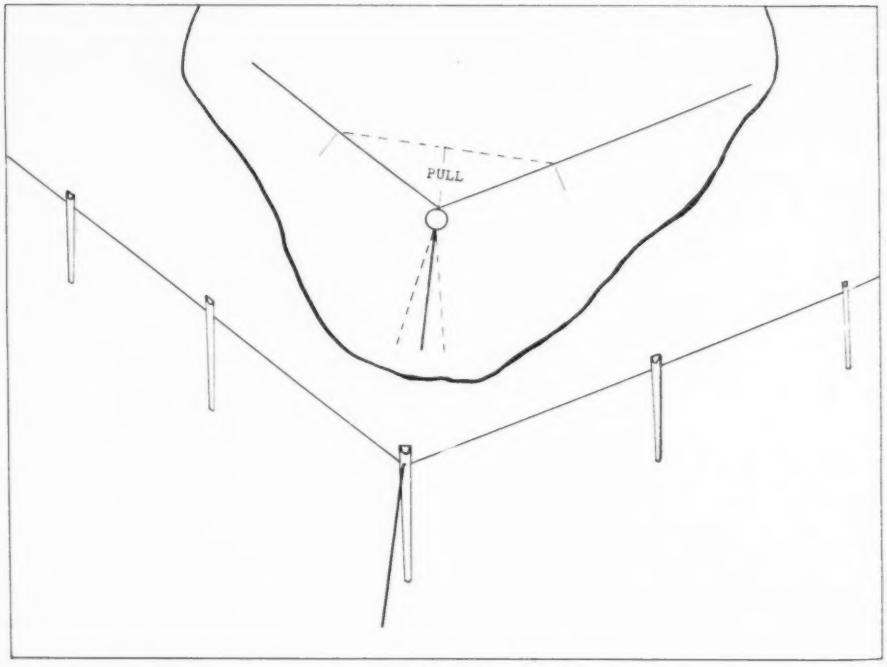

Fig. 2

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Fig. 3. Used in this way, the effective load along the direction of pull, as shown in *Fig. 2*, has been nullified.

Head Guys

In previous examples where a pole line is dead-ended or where the line turns a corner the use of guy wires is quite easy to understand. In addition to these uses, there are other occasions where additional support is required even though the line is not dead-ended or does not turn a corner. A long straight stretch of poles supporting a heavy load of wires or cable is subjected to a large amount of longitudinal stress during a wind storm or when covered with ice or snow. Longitudinal stress is a stress in the direction of the pole line.

While it is true that stresses of this type are supported by all the poles in a section, there always is a possibility that under severe conditions one pole may be over-stressed. This is similar to the fact that even in the strongest chain there is a weakest link. If an overstressed pole—which might be likened to a weakest pole situation—should break, an entire section of the line may collapse like a row of dominoes falling one after the other.

Guy wires can be used to strengthen a pole line longitudinally. These guy wires head in the direction of the pole line and, because of this fact, are called head guys. Basically, they are similar to a dead-end guy except that they are used at any desired place along the run.

Head guys, generally, are used in pairs—one in one direction and the other in the opposite direction. In this way the two guys act to stabilize the line in both directions. *Fig. 4* illustrates the use of head guys and side guys on the poles on either side of a major highway crossing. The objective in this instance is to strengthen the pole line at critical crossings of this type and to maintain the necessary clearances.

Fig. 5 (p. 36) shows how head guys are an advantage at reverse corners. In this case, the head guy is supporting the stress along the line and the side guys are placed at right angles to the pole line instead of bisecting the angle of pull. Even though the two side guys are on adjacent poles they are effectively pulling against each other.

While on the subject of reverse corners it is well to keep in mind that building a telephone line along both sides of a highway should be avoided if at all possible. The desirable situtation is to build the telephone line on the opposite side of the highway from the power line. This generally provides the separation between the two lines required for adequate protection. If the telephone line crisscrosses the highway with a series of reverse corners, there will be little opportunity for the power company to maintain maximum clearance from the telephone plant.

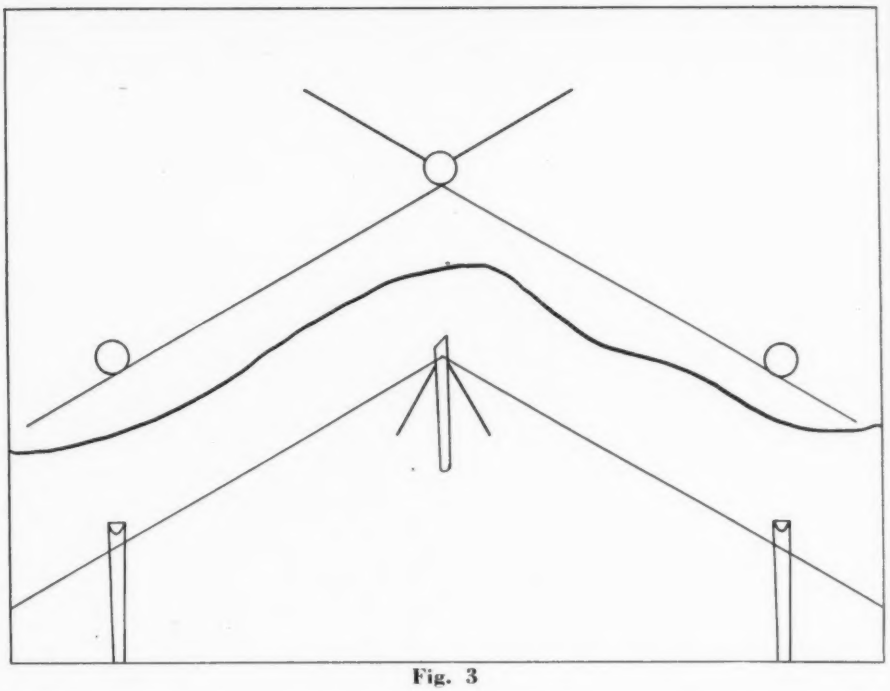


Fig. 3

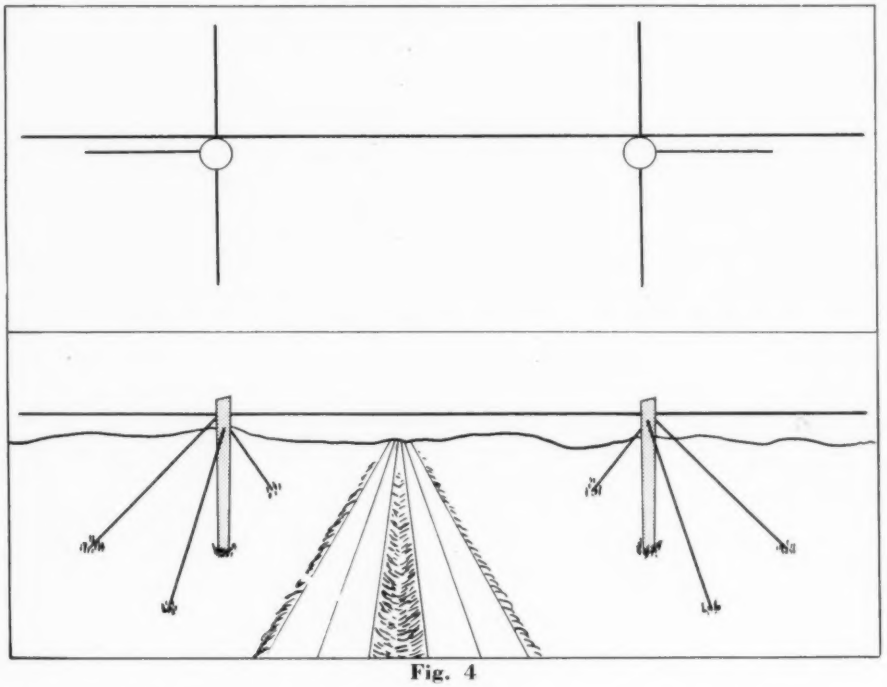


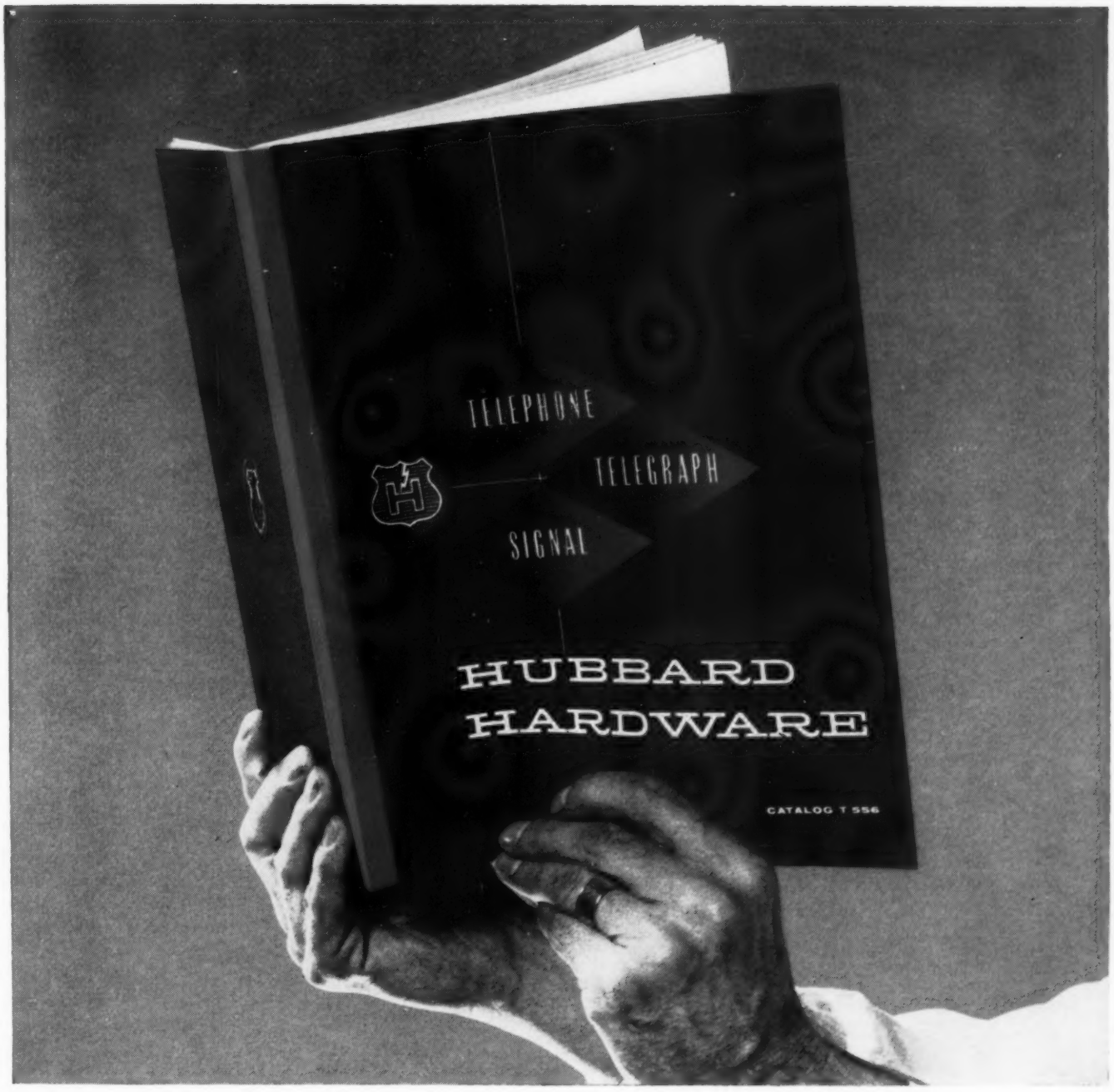
Fig. 4

Storm Guys

Storm guys are used to strengthen pole lines that are severely exposed to damage from windstorms or ice and sleet. The lines on which storm guys are most effective, generally, have long, straight stretches of long-span construction. Also, local experience is a good guide in determining if storm guys are warranted in a given area. These guys can be thought of as extra braces or stabilizer supports. They generally are used at "H" fixtures. However, they can be used at a single pole installation with excellent results.

A storm guy installation consists of at least two side guys, one placed in each direction, as in *Fig. 6A* (p. 36). Side storm guys, generally, are placed at every 15th pole on a line supporting the equivalent of 31 to 40 open wires in heavy loading areas. Longitudinal strength is added by placing a head guy in each direction at every sixth side storm guyed pole, as illustrated in *Fig. 6B.*

(Please turn to page 36)



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In accordance with this formula, two side storm guys and two head guys are installed at every 90th pole. Side storm guys are used at every eighth pole with head guys added at every 10th side storm guyed pole when heavier wire loads are involved. On this basis, two side storm guys and two head guys are used at every 80th pole.

In medium loading areas, side storm guys in either direction are suggested at every 15th pole if the poles are carrying the equivalent of from 31 to 80 open wires. The same spacing is suggested for light loading areas when the poles are carrying 41 to 80 open wires or a similar load.

Hill Guys

A pole line built up the side of a hill places a greater amount of stress on the poles than when the line is run along level ground. Even though the poles are set vertically on a hillside, the added stress is toward the downhill side. When the poles are supporting the equivalent of 20 or more open wires for five or more spans up a hill the additional stress is sufficient to warrant the use of hill guys.

A hill guy is installed on the uphill side of a given pole and is placed in the direction of the pole line like a head guy. If five poles are used on the hillside the hill guy is placed at the top pole. Where six to 10 poles are required, a second hill guy is used at one of the poles midway up the hill. On longer hills, requiring 10 or more poles, a hill guy is used at every fifth pole.

While on the subject of hill guying, it is interesting to note there appears to be no hard and fast rule with regard to what constitutes a hill. According to Webster's Dictionary, a hill is a "natural elevation of land of local area and well defined outline." Thus, a hill may be 50 feet, 3,535 feet (the highest of the Berkshire Hills in New England) or 7,216 feet (the highest of the Black Hills in South Dakota).

For this reason a pole line, as previously described, built on a 10 per cent grade should be hill guyed. Since a 10 per cent grade rises only one foot in every 10 feet, a pole line built on a long gradual incline may warrant the use of hill guys.

Use of Guy Stub

Occasionally, the presence of roadways or similar obstacles adjacent to a pole may prevent placing a guy strand at an acceptable angle without creating an accident hazard. Under these conditions, a guy stub can be installed at a suitable distance from the obstruction. Then a guy is placed between the pole and the guy stub. Finally, an anchor guy is installed between the guy stub and the guy anchor, as shown in *Fig. 7* (p. 42).

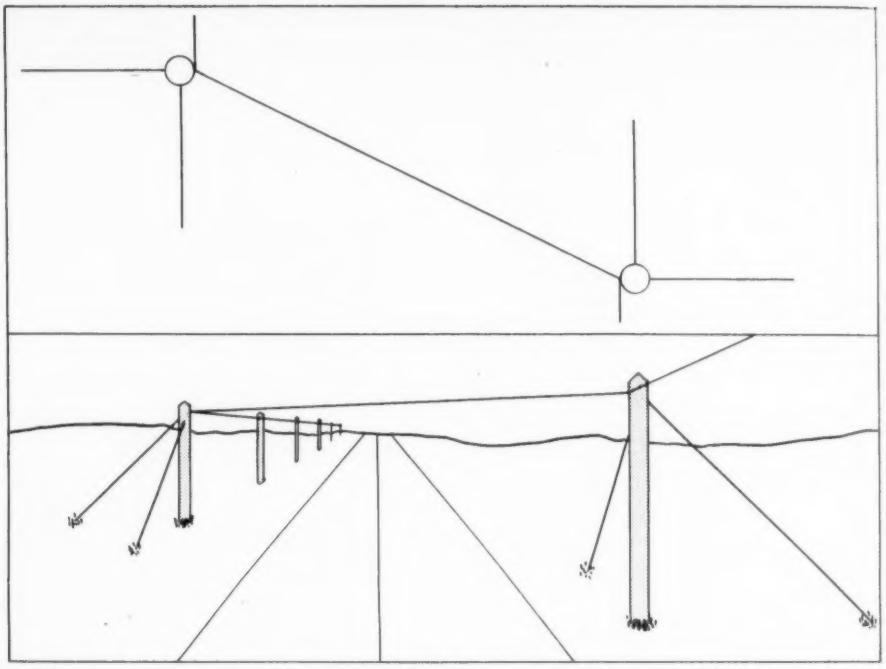

Fig. 5

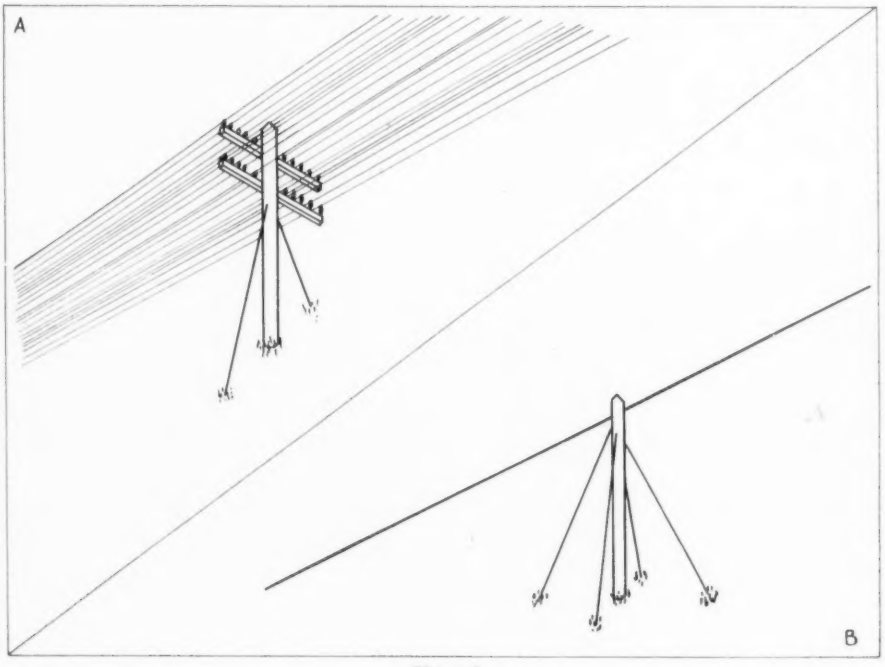

Fig. 6

Determining Guy Loads

The load on a guy wire is determined from a number of variable factors, namely:

(1) Line load.
(2) Use of guy, such as dead end, corner guy, and similar types.
(3) The lead-to-height ratio of the guy wire.

The line load at a dead-end is equivalent to the strength of a wire or conductor used, times the number of conductors. For example, assume a line in question consists of eight 104 "Extra High Strength" 40 per cent conductivity Copperweld wires. The manufacturer's specifications indicate the breaking load for this wire is 1,325 pounds. Thus, the dead-end load is:

1,325 x 8 = 10,600 pounds.

For purposes of comparison, .080 inch Extra High Strength, 30 per cent conductivity Copperweld wire has a rated strength of 900 pounds. The dead-end load for eight of these wires would be:

900 x 8 = 7,200 pounds.

The line load at corner locations is based upon the combined breaking

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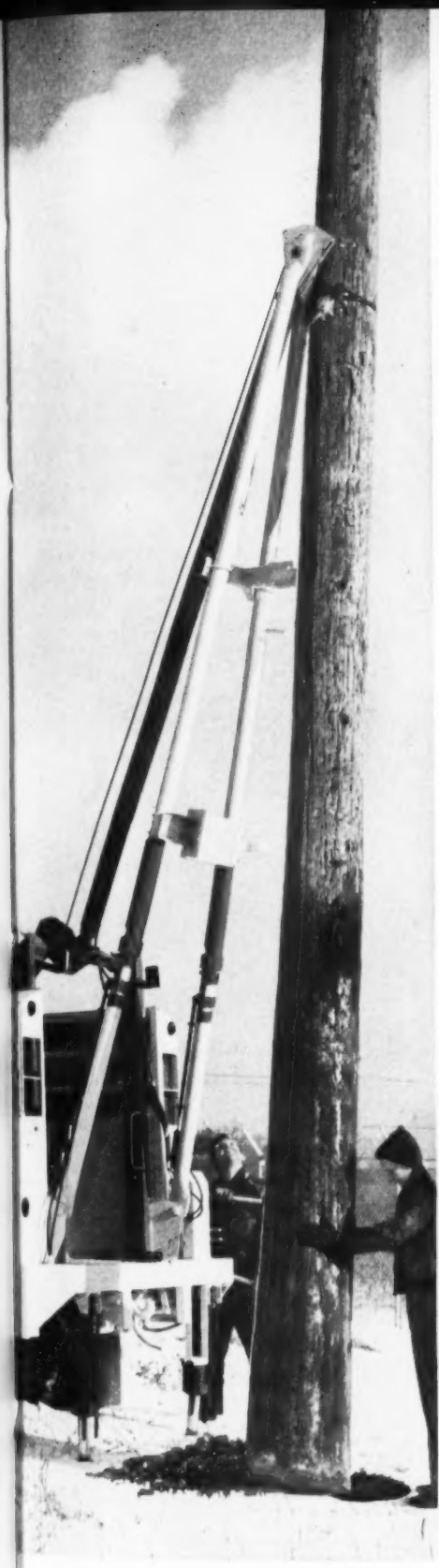

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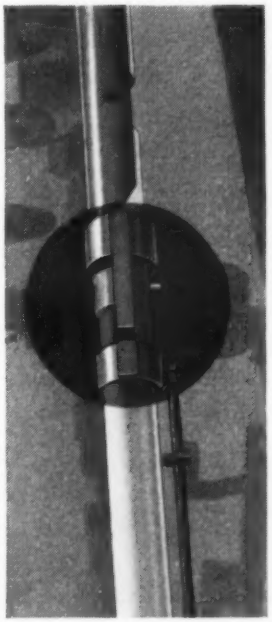

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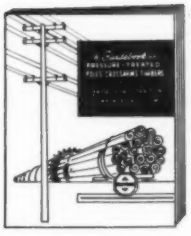

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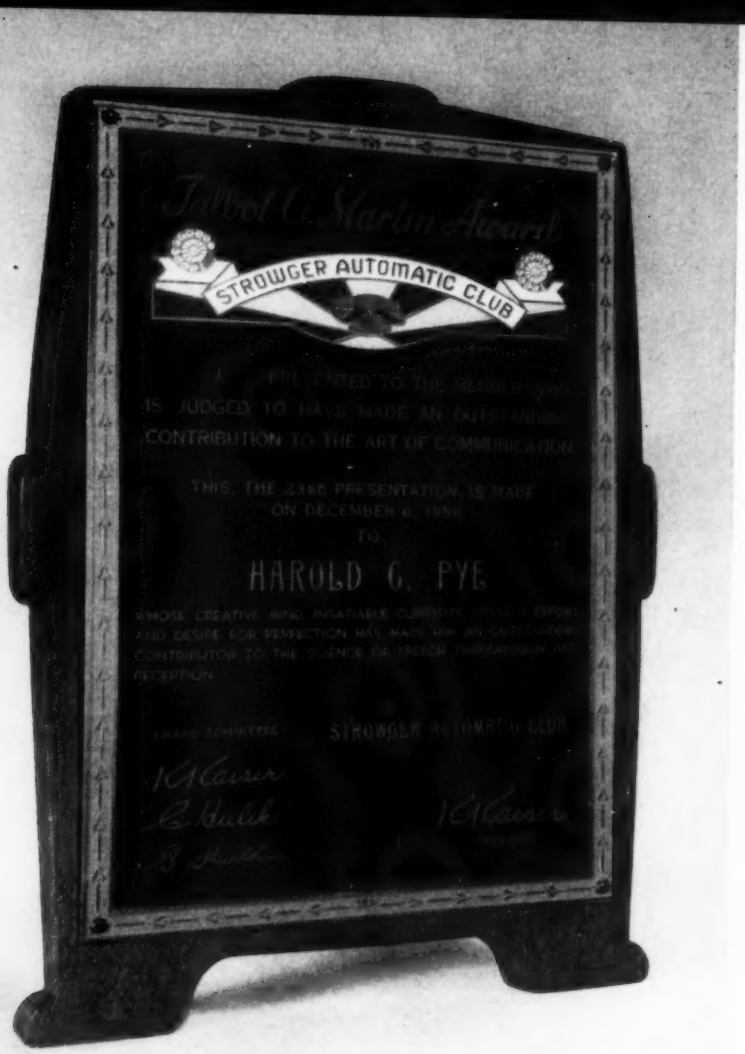

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strength of the conductors, the dead-end load, multiplied by a variable factor to compensate for the number of degrees that the line changes direction at the corner. Factors for the various degrees of direction change at a corner are listed in *Table 1.*

Number of Degrees Of Direction Change At Corner Pole	Variable Factor Used As Multiplier Of Dead-End Load
15	.262
30	.518
45	.766
60	1.000
75	1.218
90	1.414

Table 1

After looking at the table it will be noted that use of the variable factor will reduce the line load at some corners to less than the dead-end load for the same pole line. To illustrate, assume that in the first example the pole line carrying the eight 104 wires turned a 30 degree corner. In this instance the dead-end load of 10,600 pounds would be multiplied by .518, or:

10,600 x .518 = 5,491 pounds.

In the second example, assume that the pole line supporting the eight .080 wires turned a 90 degree corner. To determine the line load at the corner, the dead-end load of 7,200 pounds is multiplied by 1.414, or:

7,200 x 1.414 = 10,181 pounds.

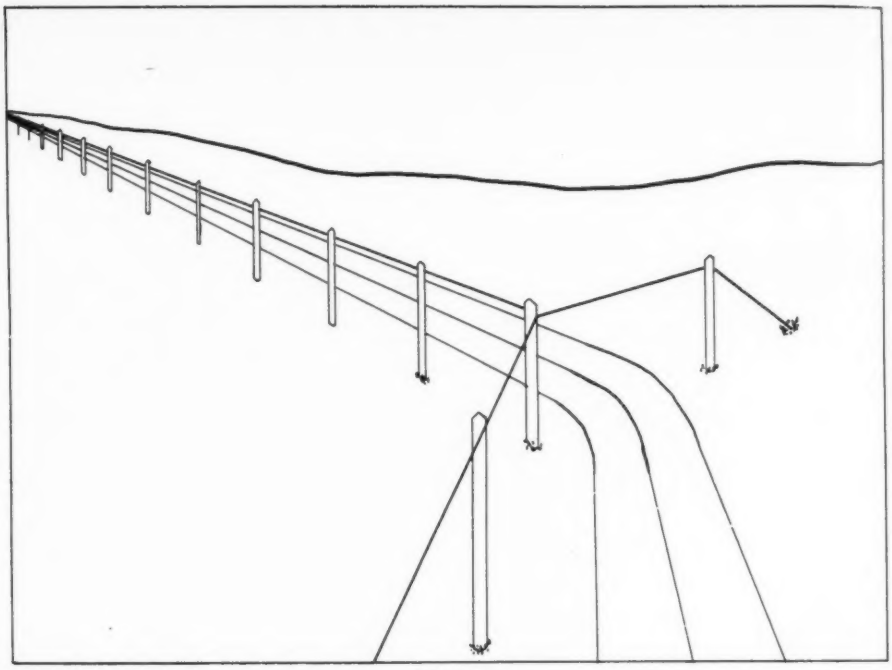

Fig. 7

The next step is to convert the effective line load into a guy load. As discussed previously, the angle of the guy wire, or the ratio between the height and lead of the guy wire, has an important bearing on the load placed on a guy wire. From a mathematical viewpoint, this step requires that the line load be multiplied by a predetermined factor based on the angle of the guy wire. The Guy Load Chart, shown in *Fig. 8*, is reproduced through the courtesy of the A. B. Chance Co.

This chart is typical of several charts which can be used for quick reference in determining the guy load at various guy angles. The chart also shows that the height-to-lead ratio favors the lead at all guy angles less than 45 degrees. For angles over 45 degrees the ratio is in favor of the height of the guy.

If the line load of 10,181 pounds is used as an example, here is how the guy load can be determined from the chart:

(Please turn to page 65)

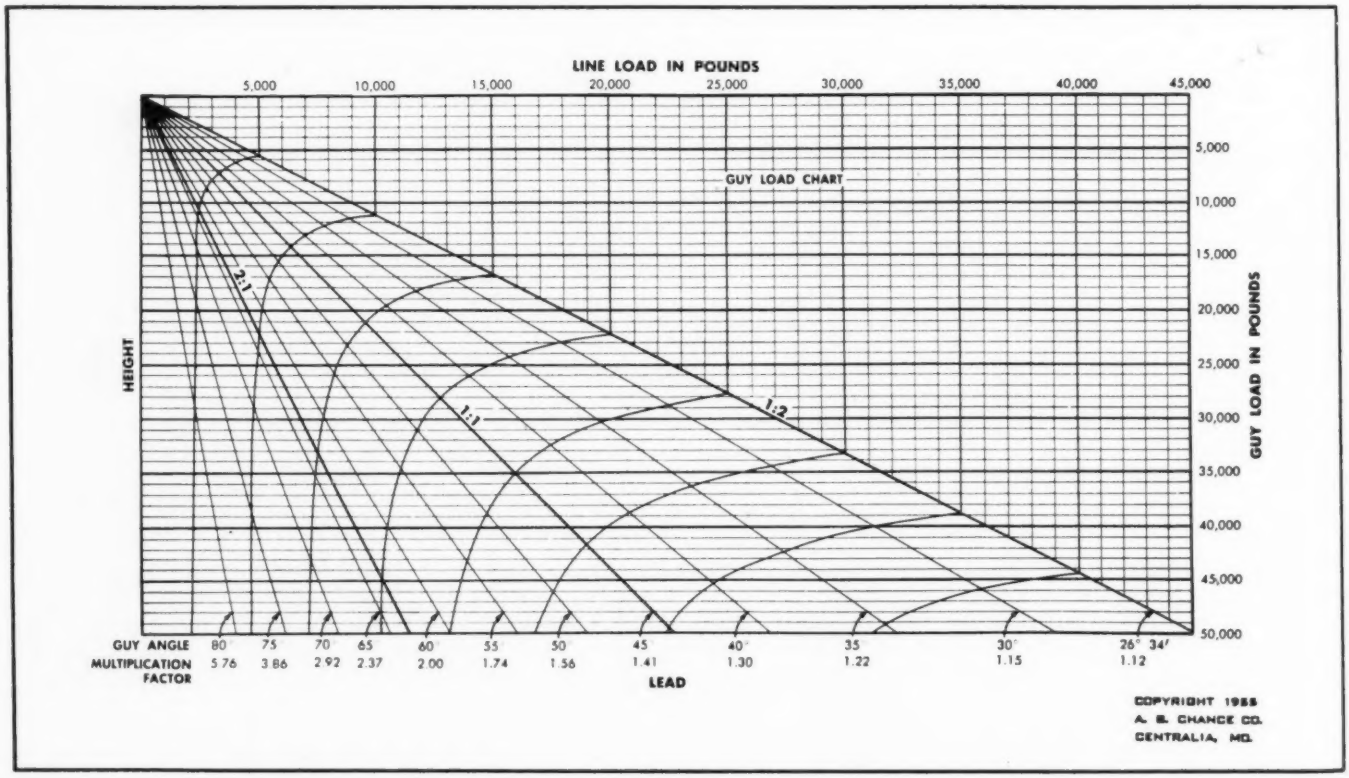

Fig. 8

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THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

THE FOLLOWING is quoted from a most interesting letter received recently from J. N. Johnson, president and general manager of the Inter-County Telephone & Telegraph Co., at Fort Myers, Fla.:

"Due to the advantages of the wonderful climate here and because we operate a 12-county area in this last frontier of Florida—which area is a fast growing one (station percentage-wise)—our station increases in 1954 and 1955 have been greater than any other company's in the state, including Bell.

"Now, as we are about to close the year 1956, we find ourselves on the threshold of a 15 or 16 per cent increase in stations, and, again, will outgain, percentage-wise, any other company in Florida, all of which results in great usage of long-haul toll in our territory.

"Only a few years ago it was most noticeable in the winter months, but we have now reached a point wherein the peaks are higher and the valleys not as deep in our toll production. We have a tremendous amount of long distance, both long and short-haul, in each of the 12 months of the year.

"In order to stimulate even more toll business we pioneered the use of outdoor telephone booths. We have our 12-county area pretty well plastered with these installations at practically every strategic location.

"Toll and local calls originating at these points have developed additional annual revenues that are outstanding with our average take per booth far greater, we understand, than the average of companies elsewhere.

"A few years ago, we devoted a portion of our business office space to six booths—four for toll and two for long distance.

"We kept these quarters open from 8 in the morning until 11 at night. More than $1,000 per month gross revenue was recorded.

"Then, to go a step further and modernize our setup, we decided to go next door to the telephone building annex and devote a space 25 feet x 20 feet for the installation of eight booths —six toll and two local. We also provided ample seating, a complete directory library and other comforts and conveniences for the local and traveling public.

"We knocked out the front of the room and made it an open air space, available to the public 24 hours a day, each day of the year (See cut).

"This space opens onto the sidewalk, having an awning overhang which gives the room a rather spacious appearance, and is so unusual that it has attracted considerable attention.

"In our search for a suitable name to identify the new development, we wanted to get away from the usual 'center' moniker, and came up with the name of 'Fone Foyer.' Then, we erected signs and gave the installation publicity. We find that the contraction of the word 'telephone' is acceptable to all, with none, to my knowledge, considering the identifying phrase as being 'corny.'

"This spot is also rapidly becoming one of great popularity and heavy usage. We believe that this 'Fone Foyer' is the largest and most unique of its kind anywhere, and further that we have a 'first' in this respect.

"We are well aware of what some of the larger cities have in the way of communication centers. And, this applies especially to some of the large hotels where batteries of both attended and unattended booths are available. These, however, are rather conventional to say the least compared to what we have developed."

New 24-hour-a-day public telephone center provided by Inter-County Telephone & Telegraph Co. at Fort Myers, Fla. This large center opened after six booths in general office produced $1,000 monthly gross revenue on 15-hour-day basis.

We agree with Mr. Johnson that he has a "first" in the telephone field. It also appears that Florida has again beaten California "to the punch." In this connection, we'll wager that we will be hearing from the Far West in the not-too-distant future.

•

When a number of spring contacts are to be mounted in a relay assembly, special washers and bushings are generally used to prevent the metal screw from short-circuiting the springs. Now we note that a nylon screw or bolt and washers can often be used for this purpose which should reduce the possibility of trouble in large spring assemblies.

•

We enjoyed a meeting in Washington, D. C., recently with E. R. Kerwin, applications engineer, wire and cable department of the General Electric Co. Mr. Kerwin has a wealth of cable information and it is always a pleasure to discuss our problems with him.

XUM

Whopping ice load again proves Copperweld's stamina

Alaska sleet storm brings record 14 inches of ice on wires!

Copperweld* Line Wire has proved its ability time and again to take the terrific punishment of rough Arctic weather on the 2,000 miles of pole line built along the Alcan Highway in 1943.

During a recent sleet storm—believed to be the worst in Alaska's history—from 2″ to 14″ of ice and snow formed on the wires. But the Copperweld Wires did not break, even with this all-time record ice load. Certainly, this is strong evidence that the permanent high strength of Copperweld Line Wire means unfailing service and less upkeep—whatever the weather.

Remember, in Copperweld, the copper is inseparably molten-welded to the steel core. Its performance has been proved in over 40 years of service. Engineering data furnished on request.

*Trade Mark

Copperweld TRADE MARK
COPPER MOLTEN-WELDED TO STEEL
Line Wire

Proved in Service
FOR OVER **40** YEARS

SOLD BY LEADING DISTRIBUTORS

COPPERWELD STEEL COMPANY
WIRE AND CABLE DIVISION *Glassport, Pa.*
For Export: COPPERWELD STEEL INTERNATIONAL COMPANY, New York

XUM

Section 27 (continued)

Reprinted from "Someone To Talk To"

By Gretta Palmer

Those are the rules of helpful listening; they are immensely hard to follow, for they require major virtues of humility, patience, self-control and restraint from judging others.

Few of us, without practice, can listen perfectly for as much as a half hour. Most of us need to exercise self-control to obey the rules for even five minutes. But Dr. Leonard Himler, of the University of Michigan, offers us this hope: "Some people," he says, "apparently without any special effort, seem to have a natural ability to make their contacts meaningful and effective. But on the basis of my own experience and of observation of students in training, I believe that everyone who has a genuine interest can steadily improve in practicing this art."

Is it important that we learn to listen? Yes—according to the men who have dealt most seriously with the subject it is immensely important. Employes in firms which provide counselors often report that interviews with them have been the most valuable experience of their lives.

"One friend, one person who is truly understanding, who takes the trouble to listen to us as we consider our problem, can change our whole outlook on the work," Dr. Elton Mayo says.

Many case histories show that this is true. A young man incapable of forcing himself to look for a job landed in the office of a counselor who did nothing but follow the rules outlined above. The man was at outs with his family, with the girls he knew, with the possibilities of his chosen work, with himself. After a half-a-dozen talks, this client said, "Now I see the mistake in thinking I was making. Thanks." The counselor had not inserted a single word to bring him closer to the answer; life, the greatest physician, had healed his difficulties more skillfully than the counselor could have done by any glib pep talk or solution of his own. As counselors are told, "We are most helpful to a person when our desire is not to solve his problem but simply to accept and understand him."

But listening may seem to be a kind if social-service work within the circle of your family and friends. "I am not," you say, "particularly interested in becoming a do-gooder. I don't welcome the chance to have one in the neighborhood come spilling his troubles into my lap. Let the professional counselors and priests and psychiatrists do this listening to other people's problems. I've trouble enough with my own."

The answer to that, as given by the scientists of social relations, is that you are a social being, whose problems are inextricably involved with those of the people around you. Listening and talking are things all of us are compelled to do from birth. If you do not listen to others with sympathy, the chances are very strong that you will not be able to pour out your troubles to them when you need help. "To have a friend, be a friend," can be rendered. "To have a listener when you need one, be a listener when someone else wishes to talk to you."

Listening pays dividends in other ways. Students who took the "Human Relations" course at Harvard last year discovered that their listening practice made even the most casual conversation a more enriching experience than it had been before.

"None of the girls who shared my dormitory poured out her soul to me," a Radcliffe student told her teacher. "But my relations with all of them improved after I had studied the rules for listening."

Another graduate of the course, faced with a family situation in which was opposition to the marriage of an older brother, found by skillful listening to both sides, he was able to bring about a happy solution.

"Imagine," he said later, "how far I'd have got with these older people if I had gone to them with two cents' worth of advice about allowing the marriage. They'd have thrown me out as an impertinent brat. But they were all aching to explain to someone why they felt that way and I was the only one around who was willing to hear them through. They told me all about their objections to the wedding and when they'd finished telling me, they didn't object any more."

So long as we are not hermits, we have to do some listening every day we live. Our chances of leading lives that are rich in friendship and love may be considerably increased if we let the scientists' studies show us how to listen well.

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Section 28

If You Dislike Criticising—That's Fine

Just about the time we think we have reached the place where we can take criticism in our stride and sincerely believe in our capacity to absorb critical torture, along comes someone who gets under our skin with a mild censure, raises "hob" with our equanimity and we are off to the races. We go on the defensive and begin making excuses for the things that brought about the criticism.

The main difficulty with criticism is that we all like to "dish it out," but few of us can "take it." The word itself is harsh and suggests fault-finding. We humans are strange individuals. We are never entirely honest as we look ourselves over. We view our conduct through rose-colored glasses. What we see pleases us and we want no change. No matter how mean, how contemptible our deportment may have been, we generally can, and usually do, find an excuse for doing as we did.

Sure we know ourselves perfectly, thoroughly. We don't need the other fellow's snide remark to wise us up. Only we are wrong—we do need the other fellow's point of view of our conduct. Inspection takes place in every kind of work. We could not any more withdraw supervision from a job than we could eliminate planning, and with all supervision goes a certain amount of criticism. Without criticism we would never know ourselves. We would never rid ourselves of annoying habits or improve ourselves.

We like to imagine ourselves as different. We say we do not object to constructive criticism, but it is the rare person indeed who does not go on the defensive when criticised. That is just human nature. A fellow who questions our crude act doesn't see the noble purpose behind it. He looks at our behavior as the whole world looks at it—devoid of polish—stark in its oneryness. And that is what he is trying to tell us, which raises Cain with our conceit.

If we took the criticism in the right way and with the right spirit we would find that he had done us one of the greatest favors possible. Criticism gives us a chance to see ourselves as others see us and we shouldn't kid ourselves—the person's audit is usually 50 per cent right on the button.

(Section 28 to be continued next week)

makes every Information Operator a STAR performer!

Put any operator before Automatic's new Type 6 Information Board, and watch! Once she flicks the "TALK" key, all she has to do is look up information. That's because automatic switching equipment (Type 6 is the first information board to have it) distributes the calls...helps the operator work *faster*. Many other useful features also speed her job and make it *easier:*

- Desks with plenty of working room (even armrests!)
- Lamps and controls all in one place
- Up to 6 directories at her fingertips
- Sound-and-sight identification of calls
- Fast-working release key
- "Link" to every incoming trunk

Prompt, more efficient Information service is a *sure thing* with this modern board. Your company, too, can have Information operators who really sparkle. Write today for the full facts in Circular 1846. Address: *Automatic Electric Sales Corporation, 1033 W: Van Buren St., Chicago 7.* Or, call *HAymarket 1-4300.*

◀ Automatic's TYPE 6 Information Board

AUTOMATIC ELECTRIC

ORIGINATORS OF THE DIAL TELEPHONE

General of California Fights Devastating Malibu-Zuma Fire

*By BEN HARVEY**

A SMALL CIRCLE of orange in the black coastal hills near the Malibu-Zuma, California coastline spotted by an airplane pilot enroute from San Francisco to Los Angeles in the early morning hours of Wednesday, Dec. 26, was the beginning of a savage fire that caused devastation and destruction to hundreds of local residents. The pilot, telephoning ahead to International Airport, alerted officials to sound an alarm, and the nearest county fire fighters were soon battling a blaze that was to last for over four days.

The fire, erratic as the forceful wind which fanned it, skipped whole valleys only to return moments later from another direction. Innumerable homes were saved at the last possible moment by a sudden inexplicable change in the wind; others apparently safe behind the lines ignited and burned to the grounds within minutes. Expensive mansions along Broadbeach Road in Trancas, Cal., fell victims to the flames as readily as the more modest homes and cabins which had been abandoned by their owners.

Many men, after seeing their families to safety, returned to fight the flames for their homes, and win, with nothing more than a garden hose in their hands. Confronted with such a chaotic enemy, firefighters concentrated on saving structures which had the best chance of being saved.

All day Wednesday the fire burned, spreading up the coast towards the Ventura County line and down towards the Malibu Colony. Firefighting reinforcements were called in from all over the county and emergency relief workers, notably those from the Salvation Army and Red Cross, moved in to help the homeless residents and the hard-pressed fighters.

Throughout the stricken area could be seen General Telephone Co. of California crews, trying to repair lines as fast as they were burned out, keeping the vital emergency lines open. They worked into the night and were back on the job early Thursday morning for another day of desperate effort.

By Thursday evening, the fire was advancing toward General's Malibu central office building. Switchman Fred McIntire was joined at the central office by Elwood Anderson, Lee Friedline and A. L. Trepp and the four men prepared to defend the building. The fire was advancing down the hill behind the structure, the flames reaching as high as 100 feet in places.

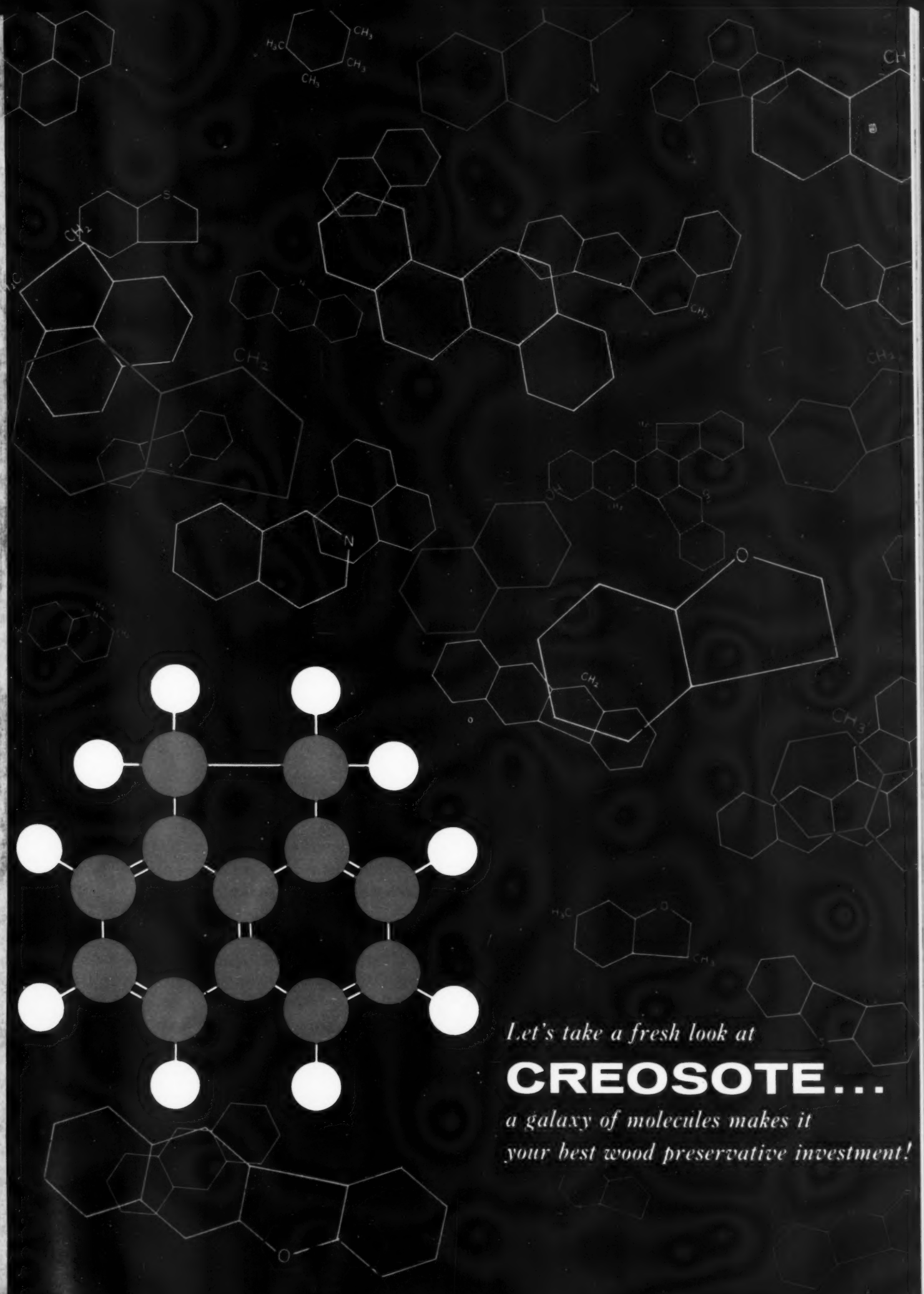
Construction Supervisor Art Piculell flagged down a county pumper truck. By manning the hose from the roof of the building, the four men managed to stop the fire before it could get close enough to do any damage.

The fire's uncontrolled advance to the east posed a potential threat to the Topanga Canyon settlement by Thursday night. To protect General's Topanga central office in case the fire reached that point, C. T. Weeks, Ed Nelson and W. R. Rooke were dispatched to the scene with a heavy truck and an insulator washing machine, which could be used to fight fire if necessary. They stood guard that night but fortunately never had to use their equipment.

(Please turn to page 53)

*Mr. Harvey is employe communications coordinator for General Telephone Co. of California.

A General Telephone Co. of California construction crew strings multiple wire over a burned area located not far from the fire lines.



Let's take a fresh look at

CREOSOTE...

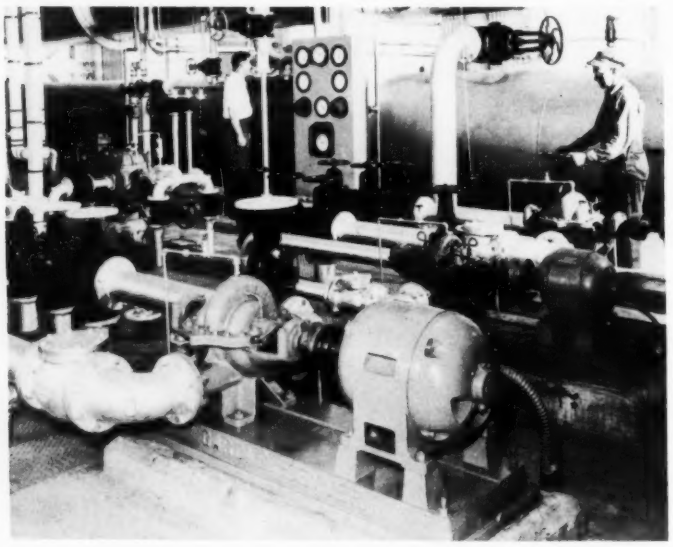
a galaxy of molecules makes it your best wood preservative investment!

Here are some vital facts you

Laboratory and field tests show why CREOSOTE gives the most protection for your preservative dollar

Laboratory Research is a never-ending process with creosote producers. Koppers researchers are constantly exploring the composition of creosote—some of its 162 chemical constituents are shown on our cover—for more information on its uniquely effective preservative action. Research such as this has already demonstrated that more than 50 of creosote's compounds are toxic to insects and fungi. This multiple toxicity is one of the reasons you can get *50-year plus* preservation from creosote.

Field Research has proved that creosote has the greatest "staying power" of any wood preservative, even under severe leaching conditions that soon render other chemicals ineffective. Tests have been conducted at a well-known marine testing facility to ascertain just what the leaching effect of sea water does to various preservatives. Creosote has shown itself to have the longest toxic life under these severe conditions. This field testing has also led to formulations of creosote that have improved its resistance to limnoria in marine service.



You, The Customer benefit from this research work since up-to-date knowledge of creosote and effective treating procedures is made available to the entire industry through the American Wood Preservers Institute. As a result of this cooperation, industry-wide specifications assure clean, uniform treatment that gives the user of pressure-creosoted wood full value for his preservative investment. A typical control room of a modern treating plant is shown at left.

CREOSOTE...
the modern preservative

XUM

should know about CREOSOTE!

Every day brings new proof that CREOSOTE gives pressure-treated wood unequaled service life

Construction Firms know, from experience, that creosote is the only wood preservative safe for use where long life of wood construction materials is the prime requisite. The piling shown, for example, was pressure-creosoted in 1897 and has been in service for 59 years without any sign of decay or structural failure. Leading consulting engineers endorse pressure-creosoted foundation piling as a construction material with an expected life of at least 100 years.

Utilities realize too, that creosote is the only preservative proved by the test of time. The poles shown have given more than 56 years service in an electrical utility's line . . . and there's no sign of replacement needed. All over the country, utilities depend on pressure-creosoted poles for long-lasting, economical distribution and transmission systems. There's nothing that can compare with creosote for clean, effective protection of utility poles: some half-million poles have been delivered to the largest utility network in the country, *and there hasn't been a single complaint about cleanliness.*

Railroads are solidly sold on creosote as the best wood preservative. Tie life depends on creosote! Through almost universal adoption of pressure-creosoting, the nation's railroads have increased the average life of their crossties from 6 years for untreated ties to more than 35 years for pressure-creosoted ties. In fact, the principal cause of tie failure today is *not* decay, but the effects of traffic and other factors which cause mechanical failure.

Wherever wood is used as a permanent construction material, experience shows your best investment in a preservative is CREOSOTE!

with a proved record.

UNIQUE CASE HISTORY

of extended utility pole life proves the unequaled preservative action of CREOSOTE!

Pressure-creosoted poles have been used in England since 1870. Many poles still in service are more than 80 years old.

In a quaint English village, Koppers Tar Products Division personnel found telegraph poles which had been installed so long ago that accurate records of their age were not available. However a search of the files of Her Majesty's Post Office, which has charge of telegraph and telephone communications, indicated that many of the poles in this same line had been in service since 1875!

A pole which bore legible markings of 1893 was removed from service for inspection. As shown in the photo below, there was no trace of decay or deterioration—even in the 8-foot portion of the pole which had been underground for more than 63 years!

It's through case histories such as this that creosote has established its recognition for proved preservative action. It's as true today as it was well over 50 years ago—*when long life of wood is required, there's no substitute for creosote.*

An official of Her Majesty's Post Office (left) and Mr. R. R. Holmes, Koppers Tar Products Division Vice President, examine good condition of buried portion of ancient pole.

Get all the facts on CREOSOTE

before you decide on any preservative treatment

Write today for your copy of this booklet telling "Why 90% of Wood Preserved Today is Preserved with Creosote." You'll find it full of facts and figures which prove that among all preservatives, your best investment is creosote . . . for long life and real economy. Address your request to Koppers Company, Inc., Tar Products Division, Dept. 1450, Pittsburgh 19, Pa., or to the Koppers District Office near you.

KOPPERS

CREOSOTE
TAR PRODUCTS DIVISION

Fatigue and strain show clearly on the face of Bob Powers, General Telephone Co. switchman, of the Malibu central office, who fought the fire for three straight days.

On Friday, General Telephone Co. of California had approximately 65 men in the burned-out area, placing drops, clearing terminals, stringing multiple wire and performing other repair work in a concentrated effort to restore full communications to the area as quickly as possible.

After ravaging much of the coast between the Ventura County line and the western portion of Malibu, the fire was directing its ferocity inland and toward the western end of San Fernando Valley.

To make matters worse, a second fire broke out near Thousand Oaks on Friday afternoon and threatened for a time to rival the Malibu blaze in extent.

To further compound the crisis and place even greater pressure on General's western division plant forces, another fire broke out in Palos Verdes in the early hours of Saturday morning. At one point during these desperate four days it was estimated that over 2,000 firefighters were in action.

The weekend brought an end to the nightmare of fire. The wind finally gave up, enabling firefighters to meet the flames on their own terms. The fight was finished, but the nation's biggest fire of 1956—in terms of property loss—left its black, ugly scars. Anyone who drives along the coast highway in the Malibu-Zuma area will see the charred brick chimneys standing like sentinels in the expanse of black ashes—only part of the 32,000 acres which were burned.

But the crisis demonstrated, once again, the amazing spirit and strength of General Telephone people in times of emergency. The damage to General's outside plant was heavy—over $17,000 in the Malibu fire alone—but the company's urgent task was to restore service as quickly as possible throughout the area.

This was done, under sometimes miserable conditions and with certain hazards, by a crew of men who showed an unquestionable devotion to duty. A grateful division manager, Ralph D. Collins, called it a "top team job."

"I've never seen an emergency situation handled so efficiently," he said. "Everyone associated with it performed wonderfully. They worked night and day and gave of their time willingly to get our part of the job done. All this has made me deeply proud of our people."

AT&T Reports Earnings Increase In Year of Record Financing

EARNINGS of the Bell System in 1956 were equal to $13.16 a share of American Telephone & Telegraph Co. stock compared with $13.10 in 1955, Frederick R. Kappel, president of AT&T, said on Feb. 19 in the company's annual report.

The 1956 earnings were on 57,423,000 average shares outstanding, an increase of 6,717,000 from the average number of shares in the previous year.

Bell System earnings on total capital were 6.8 per cent, the same as in 1955.

The AT&T report was mailed to about 1½ million share owners, nearly two and a half times as many as those in any other company. It summed up a year of record financing and construction by the Bell companies.

The Bell System spent more than 2.2 billion dollars for construction last year and will need to spend more in 1957, Mr. Kappel reported.

"In these times of unprecedented growth, with the need to obtain billions of dollars of new capital from investors," Mr. Kappel said, "earnings above the present levels are required."

Increases in telephone rates are needed in many areas, he said.

"Right now, in common with all other business, we are experiencing higher costs of operation, including higher wage costs. We cannot escape this, for we must have able people and pay to get them.

"We have continuously better equipment and operating methods. But the costs that arise from inflation are much greater than these savings."

The report pointed out:

The Bell System last year added 3,227,000 telephones—almost as many as the record gain in 1946. By the end of the year, the number of Bell telephones in service was nearly 49.5 million.

Long distance conversations were up nearly 10 per cent over 1955.

Some 11 million customers can now dial nearby cities and towns directly, and 2.7 million can dial as many as 20 million other telephones all over the nation.

Since the opening of the transatlantic telephone cable last fall, calls to and from Great Britain have nearly doubled.

Share owners last year, Mr. Kappel noted, received valuable rights which entitled them to subscribe for one new share at par, $100 a share, for each 10 shares held. Some 5,715,000 shares, 99.8 per cent of those offered, were purchased. More than half the share owners used their rights to buy stock and bought more than two-thirds of the issue.

"The average market value of the rights was $6.93," Mr. Kappel said. "This is the eighth time since 1946 that our share owners have had rights to subscribe to new securities. The market value of such rights for each share has totaled about $22."

In 1956, the Bell System added 41,000 employes, for a total of 787,000. More than 115,000 of these employes have been with the Bell System 25 years or more. Some 345,000 have served less than five years.

"But whether they are old or young in experience, the part they take in their communities, and their skills and spirit and understanding of what telephone users expect of them, are the greatest asset we have," Mr. Kappel said.

The AT&T president also cited new telephone services under development. These included:

A home communicating system that will provide new convenience in answering calls, talking from room to

(Please turn to page 74)

XUM

Courts and Commissions

Minnesota Commission Grants Rates for Two Companies

Minnesota's Railroad & Warehouse Commission on Feb. 6 approved an increase in the Robbin Rural Telephone Co.'s rural multi-party rate, and on Feb. 5 set Electronic Secretary rates and charges for the Melrose Telephone Co.

The commission estimated that an increase in the gross multi-party rate from $2.75 to $3.25 for the Robbin Rural company would raise total operating revenues from $2,700 to $3,240, and net income from $401 to $805, a 4.57 per cent return on a plant investment figure of $17,600. The company serves approximately 90 stations and receives switching service from the Drayton, N. D. exchange of the Polar Rural Telephone Mutual Aid Corp.

For the Melrose company, the commission approved the following:

	Monthly Rate	*Installation Charge*
Electronic Secretary	$12.50	$15.00
Call-back feature	6.00	10.00

Indiana Company Granted Raises at Five Exchanges

New telephone rates for Seymour, Brownstown, Reddington, Freetown and Crothersville, effective Feb. 1, were granted to the Indiana Telephone Corp. by the Indiana Public Service Commission recently (TELEPHONY, Aug. 11, 1956, p. 30).

Rates for Seymour, Reddington and Freetown are as follows: One-party business, $10; two-party business, $9.00; multi-party business, $8.50; rural business, $8.50; one-party residence, $6.00; two-party residence, $5.50; multi-party residence, $4.60; rural residence, $4.25.

Rates for Crothersville are: One-party business, $8.00; two-party business, $7.00; multi-party business, $6.50; rural business, $6.50; one-party residence, $5.00; two-party residence, $4.50; multi-party residence, $4.00; rural residence, $3.85.

Rates for Brownstown are: One-party business, $9.00; two-party business, $8.00; multi-party business, $7.50; rural business, $7.50; one-party residence, $5.50; two-party residence, $5.00; multi-party residence, $4.30; rural residence, $4.05.

Indiana Telephone Corp. recently completed extensive improvements, including installation of an automatic system throughout most of Jackson County.

Missouri Company Receives Approval on Raised Rates

Rate schedules which will increase Fidelity Telephone Co.'s gross revenue by approximately $31,000 were approved by the Missouri Public Service Commission on Jan. 25. The rates became effective Feb. 1.

At the Dec. 11 hearing before the commission the company asked permission to increase their gross revenue by $61,200.

The new rates compare with those formerly in effect as follows:

	Old	*New*
One-party business	$6.50	$8.00
Two-party business	5.50	7.25
Four-party business	4.50	6.50
One-party residence	3.75	5.00
Two-party residence	3.25	4.50
Four-party residence	2.75	4.00
Rural:		
Business	5.00	6.00
Residence	3.50	4.00

New England T&T Rate Plea Rejected in Vermont

In a ruling expected to be appealed to the state supreme court, the Vermont Public Service Commission rejected on Feb. 7 an application by the New England Telephone & Telegraph Co. for a rate increase of $253,000.

The commission asserted that the proposed rate increase was "not just and reasonable and should be disallowed." The commission contended that the company's financial condition under its old rate schedule was sound and improving.

The higher rates sought by the company have been in effect under bond since April 19, 1956. If the commission's stand is not reversed, telephone users in the state will receive refunds on the overpayments.

Miss. City Files Answer in Permanent Franchise Case

The city of Meridian, Miss., filed an answer and counter-claim in the city's federal court to a suit instituted by the Southern Bell Telephone & Telegraph Co. against the city as a test case, it was reported on Jan. 21. The original suit by the telephone company seeks a declaratory verdict which would prevent the city from collecting 2 per cent of the local service charges for use of public-owned property in the municipality.

City attorneys, in their answer, said that "the act of the Mississippi legislature of 1886, which the telephone company is claiming gave them a permanent right to use of streets, alleys and public places in all political subdivisions of the state of Mississippi, was merely a temporary license and was revoked by the adoption of the Constitution of 1890.

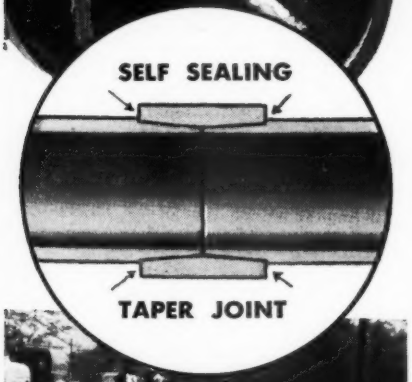
"That, even though such grant is held to be the grant of a permanent right-of-way, the telephone company, by virtue of the provisions of the Constitution of 1890, relinquished such grant by taking advantage of laws passed under the Constitution of 1890.

"That, even though such grant was the grant of a permanent right-of-way and was relinquished by reason of the telephone company taking advantage of the laws passed under the Constitution of 1890, the city of Meridian reacquired such easement by adverse possession by requiring the payment of a consideration for the use of its streets, alleys and public places from the telephone company since 1890.

"That, if the grant was a grant of a permanent easement, if the telephone company did not surrender said easement by taking advantage of the laws passed under the Constitution of 1890, and if the city of Meridian has not reacquired said easement by adverse possession, nevertheless, the telephone company is estopped to claim any such easement because of its acts in paying the city of Meridian a consideration for the use of its streets,

(Please turn to page 58)

SMOOTH BORE!



Orangeburg Fibre Conduit Prolongs Cable Life

Protect cable sheath from abrasion and you prolong the life of underground cables, say utility engineers. Scoring of cable sheath creates "trouble spots" that shorten cable life.

That's where Orangeburg Fibre Conduit plays an important part in keeping cables healthy. Orangeburg's smooth bore, its low coefficient of friction minimize the danger of abrasion when cables are pulled in, as well as later on during cable movement. By protecting cable sheath from abrasion, Orangeburg Fibre Conduit adds years to cable life.

Orangeburg's impermeable wall and watertight joints protect cables from corrosive ground waters. Its nonmetallic material is strong, tough, resilient, long lasting.

And, remember, Orangeburg lays faster and at lower cost than other types of conduit. It is light in weight, easy to handle, easy to tool on the job. Spacers, bends, fittings, 5° bend sections and lightweight tapering tool, all combine to simplify installation.

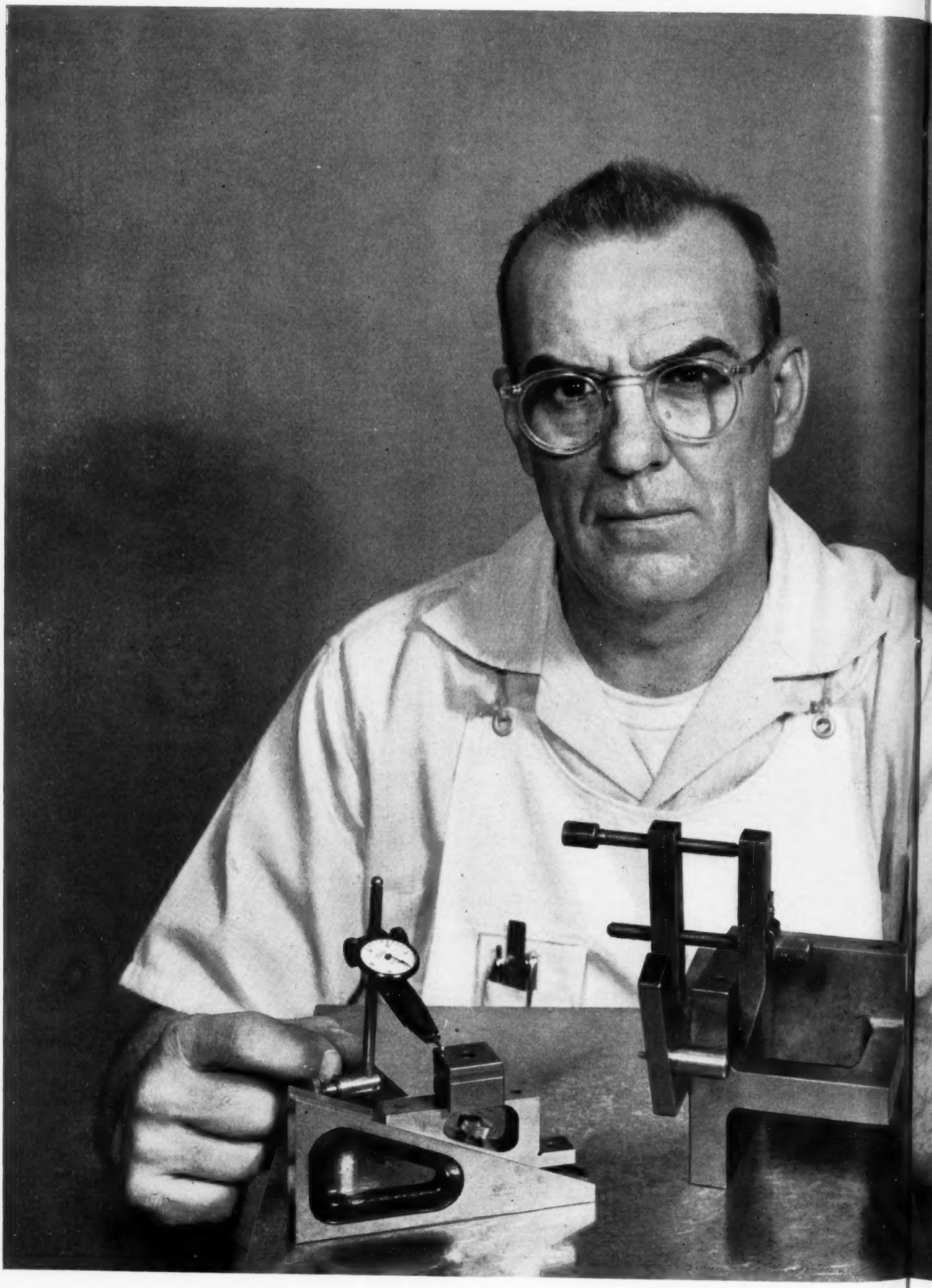
Since 1893, records of long life have proved Orangeburg's durability and economy.

Orangeburg Fibre Conduit is distributed by Graybar Electric Company and General Electric Supply Company with branches and stocks in principal cities.

WRITE DEPT. T-27 FOR NEW CATALOG 52.

ORANGEBURG MANUFACTURING CO., INC., Orangeburg, N. Y. West Coast Plant, Newark, Calif.

ORANGEBURG®
FIBRE CONDUIT



PORTRAIT OF AN INDUSTRY

The Toolmaker

He's the man behind the man who operates the machine. With the highest order of craftsmanship, the toolmaker, working to tolerances almost infinitely precise, shapes the molds, dies and punches that will be used to produce the parts of fine telephone equipment for Bell telephone companies.

Thus, like the lineman and the operator, the toolmaker lends his special skills and talents to help achieve the common goal of the telephone industry . . . providing better telephone service for America.

Western Electric

MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM

alleys and public places since 1899 and because it has never turned in such easement for ad valorem taxes.

"That the telephone company is now using said streets, alleys and public places in the city of Meridian by sufferance of the city and is clearly liable under House Bill No. 123, passed at the 1956 session of the legislature, for 2 per cent of its local service charges since March 29, 1956."

The city also seeks to have the telephone company show the amount of its local service charges since the law went into effect.

City attorneys said that the case will probably be heard in Meridian's federal court at the March term.

FCC Directs Bell System To Permit "Hush-A-Phone"

The Federal Communications Commission has directed that American Telephone & Telegraph Co., and its Bell System subsidiaries permit telephone subscribers to use the "Hush-A-Phone" and similar devices, it was reported on Feb. 7 (TELEPHONY, Jan. 12, 1957, p. 19; Jan. 7, 1956, p. 38; also this issue, p. 17).

The Hush-A-Phone Corp. of New York City had challenged telephone company regulations prohibiting "foreign attachments" on telephones.

The U. S. Court of Appeals for the District of Columbia circuit had ruled a subscriber has a right to use his telephone "in ways which are privately beneficial without being publicly detrimental."

The Hush-A-Phone is a cup-like device which can be snapped on the telephone mouthpiece to give privacy to conversations and shut out surrounding noise.

The FCC directive gives the telephone companies until Apr. 1 to revise their published rules so as to remove the prohibition.

Kentucky Independent's Financing Approved

The Consolidated Telephone Co., Florence, recently secured authority from the Kentucky Public Service Commission to finance its proposed expansion and improvement program.

Proposed telephone rate increases were to be acted upon as the improvements progress, the commission told company officials in its order.

The order permits the company to borrow up to $500,000; issue up to 20,000 shares of preferred stock at $10 par value and 20,000 shares of common stock at $10 par value, or to arrange financing with the manufacturer of telephone equipment.

The John B. Long Award for the best General Telephone Co. of California story of 1956 was awarded by Harlan W. Holmwood (center), executive vice president, to Chester R. Baldwin (left), manager of General's Downey exchange and A. G. Cooley (right), central division manager at the first annual General Telephone Co. of California press conference held at the California Country Club in Whittier. The award was made to Mr. Baldwin and Mr. Cooley for their efforts in promoting the cooperation of the Artesia *News* to write a story about bedfast Bobby Goar of Artesia, a post-polio patient who participated in classroom discussions from his home through the aid of General Telephone Co. equipment. The award is named after John B. Long, general manager of the California Newspaper Association.

The commission also granted the company permission to proceed immediately with conversion of its Hebron, Walton and Burlington exchanges from magneto to automatic service and construct additional facilities in other exchanges. The total improvement cost estimate is $765,000.

N. D. Companies Ask OKs on Rates, Purchase Approval

The North Dakota Public Service Commission was scheduled to hear on Feb. 5 the application of the Maas Telephone Co., Buchanan, to increase rates from $2.50 to $3.75 for rural multi-party residence service.

On Feb. 6, the commission was to hear the request of the Halstad Telephone Co. to buy from the Pioneer Telephone Co., Waconia, Minn., lines and facilities serving 18 subscribers in Traill County, and approval of a rate schedule applying to subscribers in North Dakota, including $4.25 for rural multi-party business service and $3.50 for residence service on rural multi-party lines.

Asks to Issue $225,000 Note

The New York Public Service Commission was scheduled to hear on Feb. 18 the petition of the Red Hook Telephone Co. for authority to issue a 5 per cent 20-year note in the amount of $225,000.

Kansas Commission Approves Two Rate Raises, One Sale

The Kansas Corporation Commission on Feb. 7 took the following action::

S&T Telephone Cooperative Association, Brewster, was granted an interim dial service rate schedule for three exchanges, when these are converted to automatic within a few weeks. The rates include $8.25 for one-party business service, $5.50 for one-party residence, and $4.75 for rural residence service at Brewster, Kanorado and Levant.

Leroy Telephone Co. was granted an annual increase in rates of $2,701.20, affecting 244 customers.

The purchase of the Riley Rural Telephone Co. by the Junction City Telephone Co. also was approved.

Vote to Sell to Ill. Co-op

Stockholders of the Coatsburg (Ill.) Telephone Exchange, Inc., a nonprofit organization, voted to sell to the Adams Telephone Cooperative, Camp Point. The Adams co-op has announced it plans to install automatic service and improve the system.

Left Photo: New Lincoln (Neb.) Telephone & Telegraph Co. building at Beatrice is of masonry construction with facing in rancho brick. Two stories and full basement provide quarters for district and area offices, the business office, service department, operating department and motor vehicles. The $325,000 building is 112 feet long and 82 feet wide. Right Photo: New drive-in payment window won immediate approval of Beatrice customers. Over 65 per cent of collections are received here. Lincoln T&T is currently engaged in converting 10,000 stations to automatic operation at its major exchanges at Beatrice, Wahoo, David City and Ashland. In addition, CDO exchanges at Tamora and Dunbar have been converted to dial since November. Beatrice, Wahoo and David City will usher in Nebraska's first direct distance dialing (DDD). Subscribers there will be able to dial direct to 35 exchanges serving some 250,000 telephones in southeast Nebraska. SATT equipment is being installed at Beatrice. At the present time LT&T has 86 automatic exchanges and 38 manual exchanges serving a total of 129,000 stations. Following these conversions the company's dial telephones in service will increase from 75 per cent to about 84 per cent. Target date for 100 per cent dial operation is 1962.

Kansas Commission Approves Three Sales

The Kansas Corporation Commission on Feb. 13 authorized W. E. G. Dial Telephone, Inc., Gardner, to buy the Osage Telephone Co., Osage City.

The authorization included issuing $111,000 in preferred stock.

The commission also granted:

Wilson Telephone Co. authority to buy Vesper Telephone Co.

Grainfield Telephone Co. permission to issue $10,000 in preferred stock to pay for improving its system.

On Feb. 7 the commission approved the purchase of Palco Telephone Co. by Rural Telephone Service Co., Lenora (TELEPHONY, Feb. 16, p. 40).

Indiana Company Requests Increase in Rates

The Sullivan Telephone Co. filed a petition recently with the Indiana Public Service Commission seeking a rate increase for its customers in Sullivan County.

John Harbaugh, company official, stated that the company is asking the commission to establish rates based on the value of the dollar today.

There has been no rate increase requested since 1913.

To Hear Wis. Rate Pleas

The Wisconsin Public Service Commission was scheduled to hear application for a rate raise from the Beef River Valley Telephone Co. on Feb. 19; and on Feb. 20 a similar petition from the Arena & Ridgeway Telephone Co.

AIM Rates 27 Telephone Companies Well-Managed

Four Independent companies—Carolina Telephone & Telegraph Co., Tarboro, N. C.; General Telephone Corp., New York, N. Y.; Hawaiian Telephone Co., Honolulu, T. H., and Lycoming Telephone Co., Pine Grove, Pa.—were among the 27 telephone companies in the United States and Canada which won the American Institute of Management (AIM) rating of excellent management for 1956, it was announced recently in New York City. A total of 410 companies were named for 1956.

The other telephone companies in the order named by the AIM are:

Southern Bell Telephone & Telegraph Co., Southern New England Telephone Co., Pacific Telephone & Telegraph Co., Northwestern Bell Telephone Co., Wisconsin Telephone Co., and Ohio Bell Telephone Co.

American Telephone & Telegraph Co., Indiana Bell Telephone Co., Illinois Bell Telephone Co., Southwestern Bell Telephone Co., Bell Telephone Co. of Canada, Bell Telephone Co. of Pennsylvania and Cincinnati & Suburban Bell Telephone Co.

New York Telephone Co., Mountain States Telephone & Telegraph Co., New England Telephone & Telegraph Co., New Jersey Bell Telephone Co. and Chesapeake & Potomac Telephone Co. of Baltimore City.

Also Chesapeake & Potomac Telephone Co. of Virginia, Diamond State Telephone Co., Michigan Bell Telephone Co., Chesapeake & Potomac Telephone Co. of Washington, D. C. and Chesapeake & Potomac Telephone Co. of West Virginia.

Companies are rated by American Institute of Management on every function of management and not just on profits. There are 10 basic categories of management performance used by the institute to study Canadian and American business. An audit committee makes the final ratings, using a point schedule which requires 7,500 of a possible 10,000 points for excellence.

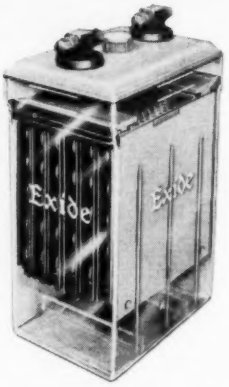
The companies are studied from the point of view of their economic justification as well as their treatment of shareowners, customers, and the public. Their capital structure as well as the customary figures are closely scrutinized, but the greatest weight is given to the evaluation of the executive team.

Electronic Living

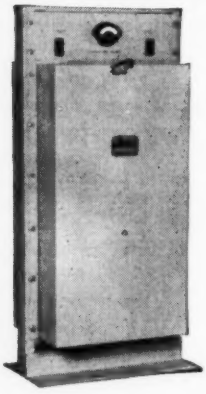
"The wonderful thing about the new developments that are going to come in electronics is that they benefit everybody. They will mean more electronic servants, more aid to better living for consumers. They will mean greater efficiency and productivity in business, more and more powerful weapons to keep our defenses strong, and new job opportunities." — FRANK M. FOLSOM, *chairman of the executive committee, Radio Corp. of America.*

XIIM

Fine Telephone Poles. Dierks Pressure-Treated Southern Pine Telephone Poles, up to 110 feet. Creosote or Penta treatment. Prompt shipment out of stock. DIERKS FORESTS, INC.



The Battery That Stays Young for Years. Built right into the Exide-Manchex Battery is a reserve supply of lead that converts automatically to active material as it's needed during the battery's long life. Hence, it keeps its full capacity for years. Exide Industrial Division, THE ELECTRIC STORAGE BATTERY COMPANY.



Automatic Constant Voltage Charger operates without moving parts. Compensates for changes in input voltage load. Single-phase Flotrol in the 24 and 48 volt types is available in range of sizes from 1 to 24 amperes.
LORAIN PRODUCTS CORPORATION.

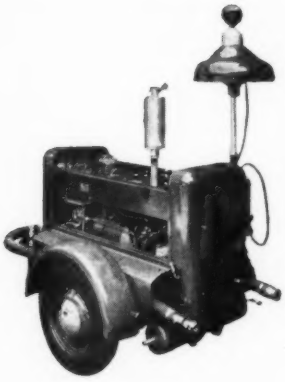
New 48-Volt Battery Charger Line. Completely redesigned Raytheon Recti-Chargers (R) feature no load to full load regulation of ±1%, no tubes, automatic compensation for rectifier aging, no audible hum. Most compact units on the market—single and three phase, output from 30 to 400 amperes. RAYTHEON MANUFACTURING COMPANY.

A GALLERY OF MASTERPIECES OF FINE LINE EQUIPMENT

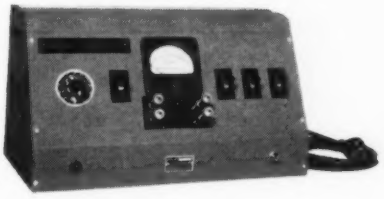
XUM

Long Service Life and Low Plant Costs go hand in hand with the installation of ENDURPRENE — The Neoprene Drop Wire available in both Copperweld and Bronze. This flexible and easy-to-handle wire is made by GENERAL INSULATED WIRE WORKS. INC.

Designed for Drainage Pumping. GORMAN-RUPP Pumps are sturdy and efficient. Ideal for use in hospital zones and residential areas. Equipped with accessories for quiet operation. Powered by 4-cycle engines—local service everywhere.



Mobile Power Unit for use by telephone cable splicing crews, for lighting, operating solder pots, solder irons and electric blowers for ventilating manholes, with a centrifugal or diaphragm pump to keep the manholes dry. S & G MANUFACTURING CORPORATION.



Shallcross #692-A Transmission Test Set. Provides a convenient and an inexpensive means of measuring transmission line losses in 600 ohm lines, switchboard circuits and other equipment. Measures comparative capacitance of condensers, and tests the balance of repeating coils and relays. SHALLCROSS MFG. COMPANY.

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To Clear Lines FASTER!
PORTER PRUNERS

The Quickest and Easiest Way For All Above-The-Ground and On-The-Ground Clearing

Made Rugged — for Rugged Work and long, trouble-free service. Blades are high quality alloy steel forgings that stay sharp longer. Small compact heads for narrow crotches. Fewer working parts. There's over 75 years of cutting "know-how" built into every Porter Pruner.

TYPE RP

TYPE RP POLE PRUNER
Long Arm plus pulley for greater leverage. Light and easy to handle. Capacity 1" green wood. Choice of solid poles (8' to 12') or jointed poles (8' to 16').

NEW TYPE M POLE PRUNER
Economical in cost but perfect in performance. Double steel hook eliminates bending and breaking. Simple mechanism — spring cannot catch or interfere when cutting. Capacity 1" green wood. Choice of poles as above.

THE FAMOUS FORESTER HEAVY DUTY BRUSH CUTTER
Faster and safer for clearing brush & cutting roots. The only cutter with the exclusive slide shift which *increases power during cutting operations.* Comes in two sizes. Cuts up to 2" green wood and leaves flush, flat-topped stumps.

TYPE M

FORESTER

Your Company can profit by the use of Porter Pruners

Porter Pruners

See them all in the Porter Catalog. Write for it today.

H. K. PORTER, INC.
Somerville 43, Massachusetts

Illinois Commission Orders Sale of Three Mutuals

The Illinois Commerce Commission on Jan. 22 ordered Illinois Bell Telephone Co. to extend its lines and facilities to provide service in the areas served by three mutuals—the Cartter Telephone Co., the Kell Telephone Co. and the Range Union Telephone Association.

The order was issued following hearing of petitions from a substantial number of subscribers from the areas of each mutual company, for service from Illinois Bell.

Carlisle, Pa. and England Celebrate Dial Service

A friendship link between Carlisle, Pennsylvania and Carlisle, England was forged on Jan. 26, when spokesmen for the namesake towns participated in a transatlantic ceremony to inaugurate dial telephone service in Carlisle, England.

Representatives of the two Carlisles exchanged greetings by overseas telephone at the suggestion of the British Post Office Authority, a governmental agency, which operates the telephone service in England.

The call from Councilor Ritson Graham, mayor of Carlisle, England to Dr. William W. Edel, president of Dickinson College, Carlisle, Pa., an honorary freeman of the English city, was handled at Carlisle, Pa. through special amplifying facilities set up by The United Telephone Co. of Pennsylvania so that an audience of interested citizens could participate in the two-way ceremony.

Carlisle, Pa. dignitaries, in addition to Dr. Edel, who talked on the dedication call included William Theurer, district manager for United of Pennsylvania; F. E. Masland Jr., president of the Masland Rug company; Harry P. Breen, Carlisle, Pa. burgess, and John Patrick Pattinson, a member of the Dickinson College faculty, a native of Windermere, England, a town near Carlisle, England.

During the course of the ceremonial telephone conversation, it developed that Carlisle, England, a city of 68,000 population, has approximately 6,500 telephones, while the United Telephone exchange in Carlisle, Pa., a city of 19,000, serves approximately 10,000 telephones.

The two communities have been drawn together in recent years by an exchange of official visitors and other gestures of friendship. Dr. Edel carried the formal greetings of this community in a visit to England in 1951 when both Carlisles were observing anniversaries with pageants and other events. The following year he was made an honorary freeman of the city for "advancing international good will."

Dr. Edel's visit was returned in 1952 by Sir Robert Chance, who brought with him an illuminated address conveying the friendship of his city for the people of Carlisle, Pa. He was the Dickinson College commencement speaker that year and received an honorary degree.

During Sir Robert's visit, he was entertained at King's Gap by Mr. Masland, president of C. H. Masland & Sons, Inc., who presented to him a rug for the town hall. The 14 x 22 rug bore the seals of the two towns. After Dr. Edel had been in England, the city sent him stones from its ancient wall, castle and cathedral and they are on permanent display at Dickinson College.

Lincoln on Labor

"I am always for the man who wishes to work."—ABRAHAM LINCOLN.

Left to right: William Theurer, Carlisle, Pa. district manager for The United Telephone Co. of Pennsylvania; F. E. Masland Jr., president of C. H. Masland & Sons Co. and Dr. W. W. Edel, president of Dickinson College, speaking on a transatlantic telephone call dedicating Carlisle, England dial telephone service.

INDEPENDENT TELEPHONES

HELP YOU REACH ALL AMERICA

America's gold coast. Rich with timber, oil, produce, fish. Modern settlers are still arriving. Getting to work planting, mining, building. More homes needed. More cars. More telephones. More lines to carry the voices of our booming west.

In every part of America, Independent telephone companies match the pace of progress. 4,700 of them now provide dependable low-cost telephone service to *two-thirds of the entire area of the nation.*

INDEPENDENT TELEPHONE COMPANIES of America

United States Independent Telephone Association
Pennsylvania Building • Washington, D. C.

This 33rd USITA national ad appeared in Feb. 11 *Time* and Feb. 22 *U. S. News and World Report*

XUM

construction and maintenance DIGEST

- New small insulator
- Lead in reserve
- Weather defier
- Indoors or out
- 3 ways better

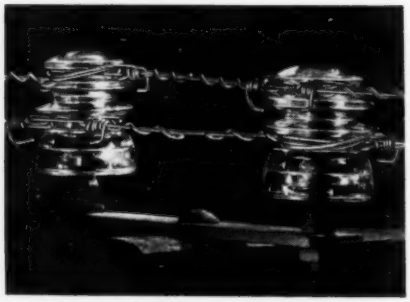
Published regularly to help you get the most out of your materials and supplies dollar

by Joseph W. Mullin, Inside Sales—Kansas City

My pet hobby is photography. Maybe you've noticed yourself—a double exposure can be mighty interesting. For instance, when you order supplies from Stromberg-Carlson you see **two** big benefits in the picture. One, you get fine products with a two-fold guarantee—ours and the maker's. The guarantee is backed by our 62-year reputation. And here's the other. Your support gives the science of telephony a push forward. As you know, this industry is a full-time job with us. Your supply orders help us continue research for new and better telephone equipment. So we say a heartfelt "thanks"—it's a pleasure to serve your supply needs.

Smaller, lighter insulator for point transposition

Weighing almost 25% less than its predecessor, the Hemingray Number 56 insulator has several important advantages. It's grooved just right to hold wire firmly. It's small and easy to install. Requires **no** special hardware, and goes on standard pins.



You'll get years of reliable service from each Hemingray insulator, because they are unaffected by sudden or seasonal temperature changes, do not age or deteriorate. All surfaces are, of course, impervious to moisture.

For faster line work on rural lines, this one-piece insulator can save you installation time, and maintenance costs.

Reserve lead keeps battery young

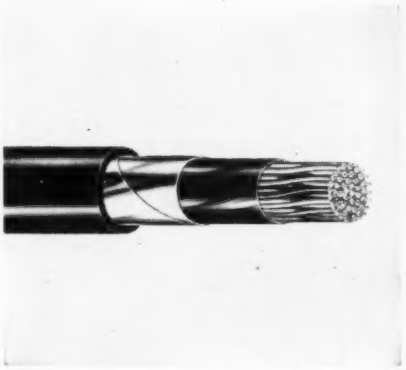
Inside the unique lead buttons in an Exide-Manchex positive plate there's a coil of reserve lead designed to prolong battery life. Over the years, as this lead is needed, it goes into action, instantly and automatically.

The unique thing about Exide-Manchex construction is that the reserve lead does not have to support the plate. The spiral lead buttons are tightly locked into a cast lead-antimony alloy grid several times more rigid than pure lead. Hence the reserve lead can be completely consumed while the plate retains its strength.

Only Exide-Manchex Batteries have this construction. In addition, they feature a plastic jar that saves weight and space, high level electrolyte for less frequent filling, and huge bottom reservoir that virtually insures against sediment shorts.

Gives maximum protection

This cable made by Ansonia Wire & Cable Company offers finer electrical characteristics than any other comparable cable.



Available in 24, 22 and 19 gauge, 11 through 404 pair

To get maximum protection against moisture and weather, specify Ansonia Type 775-P Aerial and Duct Cable.

Its conductors are individually insulated with polyethylene and paired with systematically varying lays to eliminate cross-talk. The cable is shielded with aluminum tape and protected by a tough, plasticized polyvinyl chloride jacket.

For indoor or outdoor use

Enjoy greater economy with the "Interceptor" fuseless substation protector, made by Cook Electric Company for use at subscriber stations where the omission of fuses is sanctioned by the National Electric Code.

The unit consists of a Bakelite base with heavy terminal and ground studs. Both line circuits are protected by Cook Minigap or Mytigap protectors.

The "Interceptor" can be used indoors or out. Indoors it mounts directly in a convenient location.

XUM

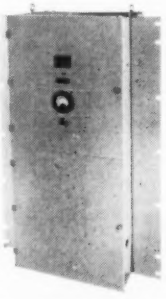
Fuseless Substation Protector.

Outdoors it is fitted with a mounting bracket and cover for home, pole or cross-arm installation.

For outdoor mounting the "Interceptor" is fully enclosed in an all-metal weatherproof housing with neoprene grommets which seal the dropwire and ground entrance.

Raytheon RectiChargeR® Battery Chargers Complete Line 3-400 Amperes

Entirely redesigned new Raytheon RectiChargeRs offer three major improvements:



New Raytheon battery chargers feature ± 1% no-load to full-load regulation

1. ±1% no-load to full-load stabilization prevents battery overcharging, minimizes gassing, lengthens battery life.

2. No audible hum at output terminals.

3. Most compact units on the market—wall or rack mounted.

Automatically compensated for rectifier aging, RectiChargeRs offer high efficiency, completely automatic regulation. No moving parts and self-protecting circuitry assure minimum maintenance, long life. Single and three phase, 3-400 amps.

Distributed by

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A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 6, Chicago 6, Kansas City 8, Rochester 3, San Francisco

ABC OF THE TELEPHONE

Continued from page 42

(1) Locate the line load at the top of the chart.

(2) Follow the vertical and curved line under the line load until it intersects the line indicating the angle of the proposed guy.

(3) From this point, follow the horizontal line across the chart to the right hand side to find the guy load in pounds.

In this example, assume that the guy angle is 50 degrees. Follow the vertical and curved line under the line load of 10,000 pounds until it intersects the 50-degree guy angle line. Then follow the horizontal line to the right hand margin where the chart indicates that the guy load is between 15,000 and 16,000 pounds.

Inasmuch as the line load is 10,181 pounds, the guy load should be increased accordingly. Thus, a reasonably approximate guy load would be 16,000 pounds.

If it is desired to obtain an exact guy load, the line load can be multiplied by the guy angle factor listed immediately below each guy angle shown on the chart. In the example being discussed, the guy load calculation would be:

10,181 x 1.56 = 15,882 pounds.

The difference between the guy load found by use of the chart and the guy load determined by using the multiplication factor is so slight that the advantages of using charts for this type of calculation are readily apparent.

The breaking strength of the conductors supported by the pole line has been used as the basis of determining the line load in these examples. A properly sagged conductor usually does not exceed 60 per cent of its breaking strength when fully loaded with ice, sleet, or snow. As a result, the safety factor of the guy is on the order of 1⅔.

This is adequate for most guys; however, a safety factor of 2 or 3 may be required at crossings over highways, railroads, and rivers. The added safety factor can be provided by selecting a stronger guy wire or by installing an additional guy wire (or wires) as required.

Guy Strand Selection

After the guy load has been determined, the proper guy strand to carry the load must be selected. This can be done by referring to a chart, available from the manufacturer, showing the physical characteristics of the guy wires selected for the job. To illustrate how a chart of this type can be used, *Table 2* was prepared from information on Crapo galvanized steel strand.

Continuing with the previous example, the proper guy wire must be capable of supporting a load of 15,882 pounds. After reviewing *Table 2* it will be noted there are five strands listed with a minimum breaking strength that is above this load. The selection of any of these strands would increase the safety factor.

Selection of the three-eighths inch, seven-wire—Extra High Strength—extra galvanized strand would reduce the safety factor by a very slight amount. Although the usual procedure is to increase the safety factor whenever possible, it is conceivable that this guy strand would prove satisfactory for the application covered by this example.

Table 2 was developed from information available in the author's files and does not cover all sizes or types of guy strand made by this manufacturer. As a result, the data on the various guy strands may be found inaccurate when compared with the manufacturer's specifications covering Crapo guy strand currently offered on the market.

With heavier line loads, sharper bends at a corner pole, and greater guy angles, it is possible that the guy

MINIMUM BREAKING STRENGTH OF GUY WIRE (IN POUNDS)

	GUY WIRE CLASSIFICATION				
Nominal Diameter Of Strand In Inches	7-Wire, Standard Grade — Single Galv.	7-Wire High Strength — Extra Galv.	7-Wire Utilities Grade — Extra Galv.	Trade Designation Of 7-Wire Utilities Grade	7-Wire Extra High Strength Extra Galv.
3/16	1,150	2,850	2,400	2,200 pound	3,990
1/4	1,900	4,750	4,600	4,000 pound	6,650
5/16	3,200	8,000	6,000	6,000 pound	11,200
3/8	4,250	10,800	11,500	10,000 pound	15,400
7/16	5,700	14,500	18,000	16,000 pound	20,800
1/2	7,400	18,800	25,000	25,000 pound	26,900

Table 2

XUM

Look to the Leader

KLEIN

for Quality

HERE'S SAFETY—SERVICE

you can always depend on. For Klein tools and equipment are designed better for your jobs—made of the finest materials—individually tested and inspected. Look for the familiar Klein trade-mark—serving the electrical industry "since 1857."

ASK YOUR SUPPLIER

Foreign Distributor:

International Standard Electric Corp., New York

100 years of service to linemen, electricians and industry is back of this new Pocket Tool Guide No. 100. A copy will be sent to you on request, without obligation.

Mathias Klein & Sons

Established 1857 · Chicago, Ill., U.S.A.

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load could exceed the minimum breaking strength of the strongest guy strand. In this situation two or more guy strands are installed to carry the load. The accepted practice is to use the same wire in each of the guys to achieve an even distribution of the load.

For example, if the guy load is 30,000 pounds, two three-eighths inch Extra High Strength guy strands, shown in *Table 2*, could be selected. If Utilities Grade strand were to be used three three-eighths inch strands would be required.

Telephone Courtesy Marked by Clergyman

The Rev. James Keller recently built his column in the Chicago *American* around an incident involving a courteous telephone operator. Reverend Keller said:

"A Connecticut businessman was pleasantly shocked in Houston, Tex., recently. He was cut off in the midst of an important telephone call to New York. Just after the call was resumed and completed, he was surprised to have the long distance operator ring him up and apologize for the interruption. She also added that charges for the call would be adjusted to a minimum rate.

"The pleased visitor asked: 'Is this another evidence of Texas courtesy or is it a general policy of the telephone company?'

" 'I don't know, sir,' she replied, 'but it is our policy here.'

"Much of the cold impersonal brusqueness of business procedure could be eliminated if enough individuals would apply ordinary Christian courtesy to everyday dealings.

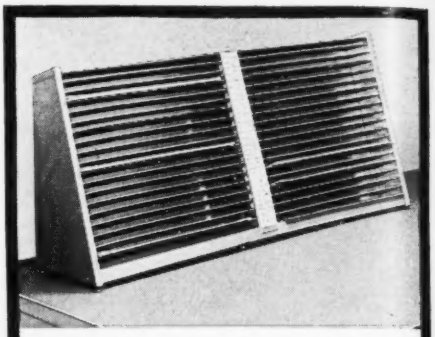
"There is a happy contagion to courtesy. It requires little effort, yet it spreads with chain reaction. Everyone can do something to apply the warmth of divine love to a world which can easily become very cold and heartless without it.

" 'Charity is patient, is kind.' I Corinthians 13:4."

Obituary

GEORGE T. PRATT, 86, who retired as wire chief of the Hamilton County Telephone Co., Aurora, Neb., in 1953 after 47 years of service, died on Feb. 7 in Ridgefield, N. J., at the home of his daughter.

Survivors include his widow, Pearl; a son, Elga, of Marshall, Neb.; two daughters, Mrs. Russell Bates of Ridgefield, N. J., and Mrs. Loyal Barker of Garden Grove, Cal.; eight grandchildren, and five great-grandchildren.



Trouble Recorder Card Rack

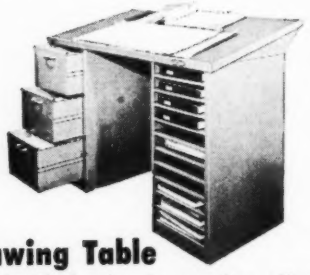
For fast orderly sorting of Trouble Recorder cards, has 38 card slots in two banks with index strip between. Base is 25" x 7". Height 11". No. D30225-1.

Telephone Office Equipment

to lighten your work and improve efficiency

Work Bench

For repair, assembly, test and paper work. Top drawer divided into 24 compartments for parts and tools. Large file drawers are for circuit drawings. 54" x 25" top covered with masonite. Height 36". Drawers may be inserted from back to reverse position of kneehole. No. D29978-3.



Drawing Table

For circuit drawing in crossbar offices, provides central location for reference material. Masonite top is 30" x 60". Height 36" at front, 42" at rear. Three large file drawers at left for drawings. Eleven shelves at right are 2½" high, 14" wide, 18" deep for sketches, sequence charts, book type SD sheets, trunk serials, etc. No. D30326-1.

Color of all units: Baked-on gray enamel unless otherwise specified.

TWIN POST Neubauer

MANUFACTURING CO.

517 LOWRY AVENUE N.E.

MINNEAPOLIS 18, MINN.

Named to Enginering Post With Two Ohio Companies

Roy A. Worley has been named general equipment engineer of the General Telephone Co. of Ohio and Ohio Consolidated Telephone Co., Clare E. Williams, president of the two companies, announced on Feb. 6.

R. A. WORLEY

In his new position, Mr. Worley will be associated with central office equipment phases of the broad construction and expansion programs planned by both companies.

Mr. Worley joins General of Ohio with long experience in telephony. He began his career in the communications industry in Nebraska in 1917, starting in the plant construction department, successively holding positions of greater responsibility.

In 1937, he accepted a position with General Telephone Co. of the Northwest and in 1945, he was named equipment supervisor of that company. In 1950, Mr. Worley was appointed chief engineer and in November 1951, was elected vice president of General of the Northwest.

Mr. Worley's broad experience in telephony has been supplemented with advanced technical training at Automatic Electric Co. in Chicago, and a number of training schools maintained by the Bell System. He is also a graduate of the Public Utilities Executive Training School of the University of Michigan.

Tax Burden Averages $1,900 Per Family

The Tax Foundation, Inc., has gathered and published the following sobering facts about the extent of the tax load in the U. S.:

"Total government tax receipts in the U. S. are, for the first time in the

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What You Want
When You Want It

Prompt delivery of your order as specified is assured by Lindsay's fast, efficient, *personalized* service . . . plus a complete line of nationally known telephone supplies. Remember—Lindsay *specializes* in telephone supplies *only*—your guarantee that you can "Look to Lindsay" for satisfaction on every order. Phone or write for immediate delivery or required data.

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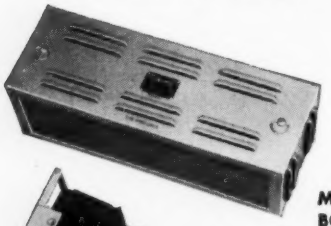
10409 Meech Ave., Cleveland 5, Ohio
Tel. Diamond 1-9212

SUB-CYCLE
your
Best Bet
for any Kind
of RINGING



MODEL
BC-205

Check THESE
MONEY-SAVING FEATURES:

- √ NO MOVING PARTS TO WEAR OUT
- √ NO CROSS RINGING DIFFICULTIES
- √ REGULATED RINGING VOLTAGE
- √ BUILT TO HANDLE TOUGH JOBS
- √ ECONOMICAL ON CURRENT
- √ PERMANENT, MAINTENANCE-FREE OPERATION

JUST INSTALL A SUB-CYCLE AND FORGET IT!

With our line of Sub-Cycles, we are in excellent position to meet the requirements of the most exacting engineers in providing ringing machines for the modern telephone plant. Let Lorain furnish you with the proper ringing facilities.

A COMPLETE LINE OF SUB-CYCLES FOR MULTI-FREQUENCY RINGING:
SYNCHROMONIC - HARMONIC
DECIMONIC
RELAY START SUB-CYCLES
STANDBY GENERATORS
"R-T" UNITS FOR PBX AND SMALL SWITCHBOARDS
BIASED CORE SUB-CYCLES

LORAIN PRODUCTS CORPORATION
1122 F STREET LORAIN, OHIO

FLOTROL
PARTNERS IN DEPENDABILITY
SUB-CYCLE

country's history, reaching the 100-billion-dollar mark. This sum equals $1,900 for each American family.

"Preliminary estimates by the Tax Foundation indicate a record-breaking collection of 99.8 billion dollars. The 100-billion-dollar mark may be passed when all final figures are tabulated.

The early estimates calculated that the federal government would collect 72 billion dollars, the state governments nearly 15 billion dollars, and local governments, 13 billion dollars. The total was almost 10 times as much as was collected by all levels of government only 20 years ago. . . .

"Tax receipts were higher at all levels of government in fiscal 1956 than in the preceding year. At the federal level they went up about 9 billion dollars; at the state, about 2 billion dollars, and only slightly less at the local level.

"Evidences of the increased 'take' at the federal level are given in the figures: In 1946, federal tax receipts were 38 billion dollars; by 1956, they had climbed to over 72 billion dollars.

Special Facilities Set Up For President's Texas Trip

President Eisenhower began his tour of the drought-stricken Southwest on Jan. 14 when the Columbine III landed to the cheers of 10,000 persons at Goodfellow Air Force Base in San Angelo.

During the 13 hours he was in San Angelo, he had full telephone communications facilities available to him. Working with the White House Signal Agency, General Telephone Co. of the Southwest had set up a switchboard with stations for every member of the White House party staying overnight at Goodfellow. The switchboard also had direct communication with the White House as well as long distance circuits, San Angelo circuits, and Goodfellow Air Force Base Circuits. It was manned by White House Signal Agency personnel.

Work installing the switchboard and stations had been going on for a week prior to the President's visit. Stations working off the switchboard included a telephone to the Columbine III. A complimentary directory of Goodfellow White House numbers was distributed.

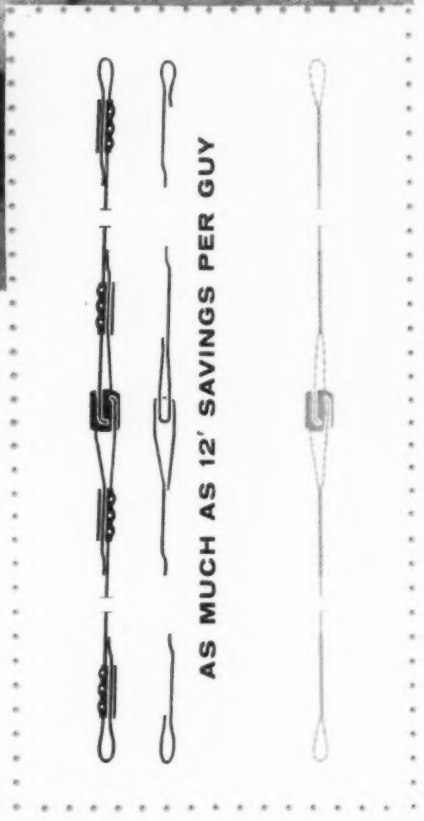
Extra telephone facilities were set up for the 125 newsmen covering the President's visit. A row of paystations in the Goodfellow Officers Club which had been designated as the White House press room were kept busy.

Kansas Independent's President Retires

E. E. Magnuson, of Smolan, president of the Salemsborg (Kan.) Telephone Co. for the past 12 years, has resigned. His successor is Vernon Miller of Assaria.

Mr. Magnuson had been a member of the board of directors of the com-

General Telephone Co. employes moving a paystation booth by way of a window into the Officers Club at Goodfellow Air Force Base. The Officers Club was converted into a press room during President Eisenhower's visit to San Angelo.



PX-80

Up to 30% savings in strand... with PLP Guy-Grip Dead-Ends

You will find real guying economy with PLP Guy-Grip dead-ends. Because they eliminate strand looping, you can use *shorter, straight* lengths of guy strand. This means as much as 12 feet savings in strand per guy. What's more, the finished installation is neat, streamlined, efficient.

Made in accordance with or for use under U. S. Patent No. 2,761,273; other patents issued and pending.

PREFORMED LINE PRODUCTS CO.

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DEPT. NO. TR2A
Telephone: Cleveland EXpress 1-3571

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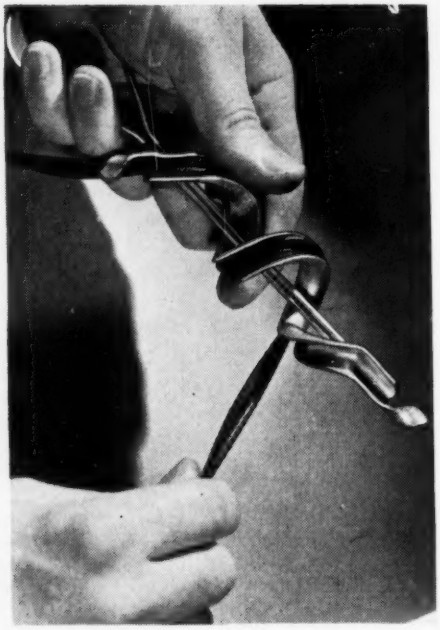

Wire-Saving Snubbing Action . . . with this

KEARNEY

SNUB-R-GRIP DROP WIRE GRIP

On poles or buildings this free-swinging drop wire tie provides a "snubbing" action stronger than the rated strength of the wire. This is possible because the unique spiral grip distributes the pull over a long length of wire. KEARNEY Snub-R-Grips are quickly installed and easily salvaged. Just wrap the wire (twisted pair, parallel or synthetic-jacketed) into the grooved spiral. A portion of the groove's inner surface is specially coated to give maximum non-slip grip . . . without damage to insulation.

For Better Construction . . . Safer Maintenance

Specify 268

KEARNEY PRODUCTS

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Canadian Plant: Guelph, Ontario

pany for 33 years and served as secretary 17 years before being elected president.

Other new officers are Vernie Applequist, vice president and Clifford Johnson, secretary. Edwin Danielson is manager.

IN THE NATION'S CAPITAL

Continued from page 18

But a mere hypothetical statement of such an extreme alternative shows how futile it is to say that fair wages have nothing to do with fair rates. Neither the telephone company nor any other employer can pay one without receiving the other. The two ought to go hand in hand.

Federal Commercial Activities Reviewed

Renewed effort to check the federal government's commercial and industrial activities has been announced by U. S. Budget Director Percival F. Brundage. Under the terms of a memorandum issued by the Budget Bureau, each department and agency would evaluate the "services" portion of its commercial-industrial activities.

The new evaluation will attempt to determine whether these "services" should be continued in the light of administration policy. If not, appropriate steps to discontinue or curtail activities would be indicated. Legal authorization for each activity is to be examined to determine whether statutory changes are needed to permit discontinuance. Reports from the agencies are to be in by Apr. 15.

Brundage emphasized the necessity for prompt and orderly action in terminating such commercial and industrial activities as an agency head finds reasonable. Additional instructions are designed to control the starting of new commercial-industrial activities.

The administration's general policy with regard to activities that may be in competition with private enterprise, as stated in the memorandum, is that the federal government will not start or carry on any commercial or industrial activity to provide a service or product for its own use if such product or service can be procured from private enterprise through ordinary business channels. Exceptions to this policy must be justified by the head of any agency seeking the same.

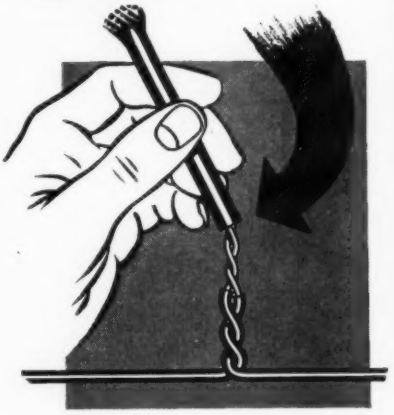
Final Hush-A-Phone Action

The last step in the long, drawn-out controversy over the use of the Hush-A-Phone appliance was taken by the Federal Communications Commission last week when it issued a final order

"Super-Splice"®

makes splices waterproof

. . . from inside out!



Superior Cable's exclusive economical "Super-Splice" is a plastic splice sleeve. It is sealed at one end and comes to you filled with an insulating and waterproofing compound.*

"Super-Splice" prevents leakage currents and breakdowns in the presence of moisture . . . good for 25,000 v. d. c.

Can be easily removed to re-enter the splice . . . the compound never hardens or oozes out no matter what the temperature.

**A Dow-Corning silicone compound.*

An REA Standard.

"Super-Splice" is available for use with straight, butt or bridge splices.

For further information on economical "SUPER-SPLICE", write

SUPERIOR CABLE

SUPERIOR CABLE CORPORATION
Hickory, North Carolina

directing Bell System companies to permit the use of the "Hush-A-Phone" and similar devices. As previously indicated in this department, this means that the Bell System has decided not to risk a further appeal to the U. S. Supreme Court from the adverse decision in the U. S. circuit court of appeals for the District of Columbia.

It will be recalled that the lower court had upheld the right of telephone subscribers to use the Hush-A-Phone if they wanted to do so. This decision had the effect of reversing a previous FCC opinion that the Hush-A-Phone (a cuplike device fitting over the end of a telephone instrument) was not a "foreign attachment," so likely to impair telephone service as to warrant refusal of telephone companies to permit its use.

The FCC has now followed up the court's decision with a formal regulation giving Hush-A-Phone a clean bill of health as far as telephone service is concerned, and ordering the Bell companies to revise their tariffs so as to permit its use.

There is a rather curious extension of this authority suggested in the phrase "or other similar devices." Any telephone attachment which is merely acoustical in its operation—that is to say, if it does not have to be physically or electronically connected with the telephone wires or other facilities—will probably be entitled to the same permission granted by the FCC for the use of Hush-A-Phone.

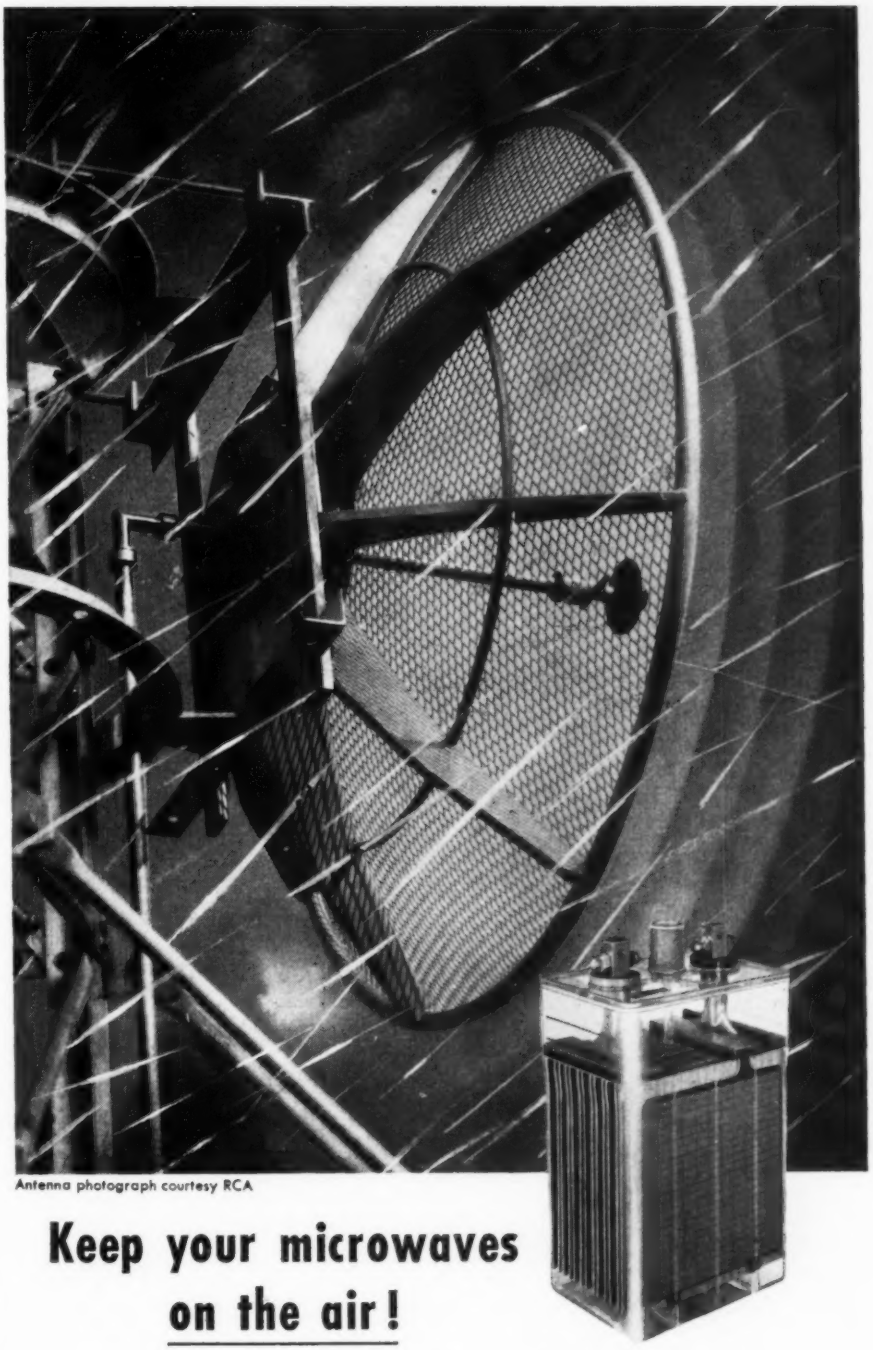
But sooner or later, the telephone industry will have to come to grips with the practical question of testing just how far the traditional "no foreign attachment" rule is to be invaded.

The decision of the telephone companies not to take a further appeal to the U. S. Supreme Court in this case is believed to be based on the relatively simple character of the Hush-A-Phone device. That being so, any further test of the traditional "no foreign attachment" rule might well be reserved for a stronger case, involving an attachment which could be definitely shown to impair or threaten to interfere with telephone service.

Incidentally, such a test appeal might also better be taken later by an Independent rather than a Bell System company to avoid the charge of attempted "monopoly" in the field of business office equipment used in conjunction with telephone service.

Bill to Boost REA Interest

Following up President Eisenhower's recent Budget message to the Congress questioning the cheapness of interest rates on REA loans, a bill on the sub-



Antenna photograph courtesy RCA

Keep your microwaves on the air!

with C&D Batteries, for standby power

C & D Batteries are always ready to help keep your vital microwave system on the air, regardless of interruptions to normal power supply.

With C & D batteries standing by, you get—

1. An emergency source of power that *always* starts.
2. Low annual cost.
3. Simplest maintenance—no working parts to get out of order; just dust and occasionally add water.
4. Long life—25 years with lead-calcium C & D PlastiCal.®

For complete details on C&D standby power, write for Bulletins T-527/55 and T-528 Rev. 3.

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Industrial Batteries since 1906
SALES AND SERVICE OFFICES IN PRINCIPAL CITIES FROM COAST TO COAST

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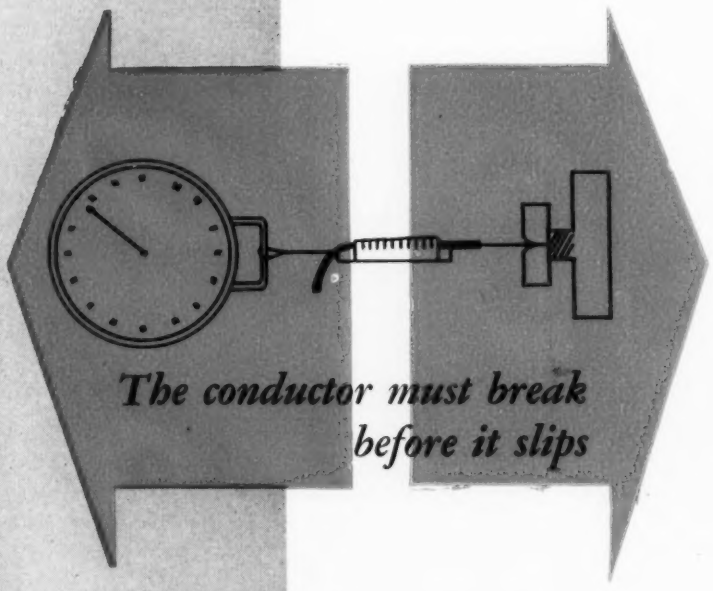
ALPHADUCT

P clamp adhesion test



The conductor must break before it slips

P clamps are the most widely used method of attaching drop wire to buildings. Lest you may worry about a P clamp causing slipping of the insulation or jacket on Alphaduct Neoprene Jacketed Drop Wire — read about this Alphaduct service test. This test is made daily.

A sample of Alphaduct wire is inserted in a P clamp with 12 inches of the wire projecting from the top of the clamp. The bail of the clamp is then inserted in the upper jaws of a tensile testing machine, and the end of the wire is stripped free of jacket and insulation and inserted in the other end of the machine.

The jaws of the machine are then gradually separated until the conductor breaks. The conductor must break before there is ANY slipping of either the jacket or the insulation.

Don't have any worries about a little old P clamp hurting ALPHADUCT drop wire. Try Alphaduct. It's dated by a color coded thread so you can see for yourself how long it lasts, how much money it saves.

ALPHADUCT WIRE AND CABLE COMPANY · NEW BRUNSWICK, N. J.

NATIONAL DISTRIBUTORS • AUTOMATIC ELECTRIC SALES CORP., CHICAGO, ILL.
LEICH SALES CORPORATION, CHICAGO, ILLINOIS
REGIONAL DISTRIBUTORS • PANKEY SUPPLY CO., CHARLOTTESVILLE, VA.
THE LINDSAY TELEPHONE SUPPLY CO., CLEVELAND, OHIO

ject has now been introduced in the House of Representatives.

It will be recalled that the President's Budget compared the present statutory interest rate of 2 per cent charged by REA for rural electrification and rural telephone loans with the 3⅜ per cent which Uncle Sam's Treasury has to pay for its own borrowed funds. The plain inference was that it is not very sensible for Uncle Sam to be borrowing money for his own Treasury at 3⅜ per cent and then lending it out on 35-year REA loans at a mere 2 per cent interest—in addition to the considerable administrative expenses of arranging, supervising, and collecting such loans.

Anyway, the new bill (H. R. 4781) is sponsored by Representative Hiestand (R., Cal.). It takes a very sensible approach in reforming the present subnormal REA interest rate. Instead of attempting to jack up the present 2 per cent rate to 3⅜ per cent or any other fixed rate, Representative Hiestand's bill would simply tie the new interest rate on REA loans to the same rate Uncle Sam has to pay himself for such borrowed funds. That might even go higher in the future if the present "tight money" trend continues.

Only last week, Treasury Secretary Humphrey moved to boost the interest rate on "Series E" Government savings bonds. It is obvious that the Treasury cannot hope to sell many of these savings bonds at an interest rate considerably lower than anyone can get on an ordinary savings account at his own bank. Hiestand's bill has been referred to the House Agriculture Committee.

One very important aspect of Representative Hiestand's bill was that it also provides that REA borrowers shall also pay an extra fee to cover the expense of administering their loans. If such REA "housekeeping expenses" could be covered in addition to getting a compensatory interest rate for loans made, REA could then be truly said to stand on its own feet without use of the taxpayer's money to subsidize its borrowers.

Our Mutual Relationships

"'No man is an island, of itself entirely,' wrote John Donne. And no businessman is an island either. In addition to the three traditional dimensions, he operates in a fourth dimension of human relations. He is caught up in a skein of human relationships with his employees, his customers, his community neighbors, his stockholders, government officials—and fellow businessmen."—J. CARROL BATEMAN, *director of public relations, Milk Industry Foundation.*

BUILD LONGER LIFE — GREATER DEPENDABILITY
into your lines with
AMCRECO POLES

To give you the best telephone pole possible, Amcreco poles are pressure treated in creosote. Not just dipped, not just soaked — but creosoted under pressure by the Amcreco treatment methods. This treatment forces protective creosote right into the cells of the wood — preserves the natural strength of the wood — assures many years of dependable service.

Poles pressure treated with creosote by Amcreco methods have high resistance to fungi, to insects, and have greater strength throughout the life of the pole. This means fewer replacements and lower maintenance costs with less service trouble. For your next job, contact one of our nearby sales offices.

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Products

AMERICAN CREOSOTING CORPORATION

Colonial Creosoting Company
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Indiana Creosoting Company

AMCRECO LOWRY PROCESS CREOSOTED WOOD

Gulf States Creosoting Company
Georgia Creosoting Company
Kettle River Company

GENERAL OFFICES: LOUISVILLE 2, KENTUCKY

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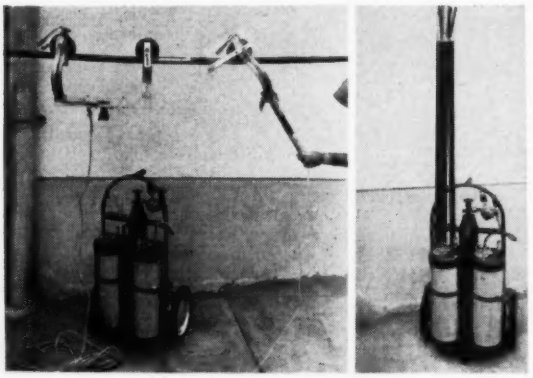
Leak Detection in Minutes!

Leak Detector Applicator



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Safety Brackets—Steel galvanized

Nozzle and Piping—brass

Liquid Line — heavy wall plastic tubing

Liquid Tank—steel galvanized and brass fittings

Wheel—nylon bearings, self-lubricating

MODEL LD-1 & LD-2

Both models use highly successful chemical type leak detector. Applicator's dual nozzle sprays both sides of pressurized cable, giving 100% coverage. Bubble cluster forms around leak within minutes and can be clearly seen from the ground. Air pressure bottle in cart supplies regulated pressure in solution tank at all times, can be adjusted for different heights.

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Push Drill No. 41

Slip in the drill point — and the famous "Yankee" chuck makes sure it stays! No slippage or pulling out of points when drill is in use.

Magazine handle holds eight drill points, 1/16" to 11/64". All exposed parts of Push Drill No. 41 are chrome plated.

No. 41

Write for free "Yankee" Tool Book. Stanley-Yankee Tools, Inc., subsidiary of The Stanley Works, Dept. 2102, Philadelphia 33, Pa.

STANLEY

AT&T EARNINGS RISE

Concluded from page 53

room, or talking from any telephone with a caller at the door.

A dial system for small businesses that will automatically connect incoming calls to a busy telephone as soon as the line is free.

A new telephone of a design especially suited for use in bedrooms.

A method for sending several conversations at the same time over local wires, and new microwave radio relay systems.

M. C. Diefendorf Named to General of Indiana Post

Marvin C. Diefendorf has been appointed public relations director of General Telephone Co. of Indiana, Fort Wayne, according to an announcement made in New York on Feb. 8 by General Telephone System's president, Donald C. Power.

M. C. DIEFENDORF

Prior to his new assignment in the Indiana company, Mr. Diefendorf has been public relations assistant at General Telephone Co. of California.

During World War II he was assigned to the Eighth Air Force in Europe, seeing action in Africa, England and Germany.

Green Light for Expansion

"The overriding recipe for more social justice and for economic betterment is, on every count, the growth of national wealth; and every prescription for 'reform' which hinders instead of helping that growth denies the very purposes for which the Labour party, in the radical tradition, claims to exist. The green light should be for expansion, not for envy."—EDITORIAL STATEMENT, *The Economist*.

Branch managers and sales personnel at meeting of telecommunication division of Stromberg-Carlson.

Stromberg-Carlson Holds Annual Sales Meeting

Approximately 90 sales engineers, branch managers and field representatives from all sections of the United States attended the annual sales meeting of the telecommunication division of Stromberg-Carlson in Rochester recently. Stromberg-Carlson is a division of General Dynamics Corp.

In opening the meeting T. C. Thompson, general sales manager, declared that sales of the telecommunication division in 1956 were approximately 30 per cent above those of the previous year. The telecommunication division supplies equipment for the Independent telephone companies in this country, as well as telephone type products for industry.

Among the new Stromberg-Carlson products demonstrated to the representatives during the week-long meeting are the Pagemaster selective radio pag-

Build lines today...
FOR TOMORROW

WITH T-C PRESSURE-TREATED POLES

You build for safety and minimum maintenance in future years when you use T-C pressure-treated poles and cross arms.

T-C pressure treatment is sure protection against termites and rot. The T-C process, developed and refined over the past 30 years permits the preservative to penetrate deeper and more uniform — assuring long service life. "Build for Tomorrow . . . specify T-C pressure-treated protection.

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TAYLOR-COLQUITT CO. TIMBER CONSERVATION T-C

TAYLOR - COLQUITT CO.
SPARTANBURG, SOUTH CAROLINA

PLANTS AT SPARTANBURG, SOUTH CAROLINA AND WILMINGTON, NORTH CAROLINA

New Bi-Directional Power Monitor

25 to 1,000 mc

10 to 500 watts

Only 2 plug-in elements

MODEL 164

Quickly measures incident or reflected power, simplifies matching loads to lines

New Sierra Model 164 is a compact, versatile, bi-directional monitor for intermittent or continuous measuring of incident or reflected power, or convenient and precise matching of loads to lines. The instrument offers unequalled measuring ease and economy, since only two plug-in elements are required for coverage of all frequencies 25 to 1,000 mc and wattages 10 to 500 watts. Two plug-in elements cover, respectively, 25 to 250 mc and 200 to 1,000 mc. Both have 4 power ranges: 10, 50, 100 and 500 watts. Accuracy is ± 5% full scale. No auxiliary power is required to operate the instrument.

Because of its compact size and wide range, Model 164 is ideal for portable applications (mobile, aircraft, etc.) as well as laboratory use. It is supplied in a sturdy carrying case (one or both plug-in elements supplied as ordered) and both meter and directional coupler may be removed from the case for remote monitoring. The monitor may be equipped for most connectors normally employed with 50 ohm lines. A twist of the wrist selects incident or reflected power, or any power range, without requiring removal of power. No exchange of plug-in elements is necessary to read low levels of reflected power.

TENTATIVE SPECIFICATIONS

Power Ranges: 10, 50, 100 and 500 watts full scale direct reading.

Accuracy: ± 5% of full scale.

Insertion VSWR: Less than 1.08.

Impedance: 50 ohm coaxial line.

Frequency Ranges: 25 to 1,000 mc. Two plug-in elements.

Low Frequency Element: 25 to 250 mc.

High Frequency Element: 200 to 1,000 mc.

Data subject to change without notice.

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Manufacturers of Carrier Frequency Voltmeters, Directional Couplers, Wave Analyzers, Line Fault Analyzers, Wideband RF Transformers, Custom Radio Transmitters, VHF-UHF Detectors, Variable Impedance Wattmeters, Reflection Coefficient Meters, Calorimeters, Water Loads, Thermopiles, Ion Gauge and Ion Gauge Amplifiers, Phase Changers. 3317

ing system, transistorized electronic telephone switching equipment, new carrier and multiplexing equipment by which mulitple telephone conversations or other signals are "stacked" for simultaneous transmission over the same wire line or radio beam, a transistorized amplifier for telephone applications, and other specialized telephone apparatus.

The program included a tour of the plant facilities, including the new 5-million-dollar administrative and manufacturing building now under construction, parts of which are already occupied by telephone assembly lines. The company stated that this plant will be devoted entirely to the telecommunication division as soon as the company's electronics division can be moved to the recently-purchased "Style Manor" plant.

Concord (N. C.) Co. New Exchange Provides for DDD

The Concord (N. C.) Telephone Co. has put into service a new million-dollar dial service and exchange building at Albemarle, thus completing an automatic network of four exchanges serving more than 7,000 subscribers. Provision has been made for Direct Distance Dialing (DDD) of toll calls in the near future.

Albemarle will become a tributary office of the company's toll center at Concord. The new equipment, manufactured by Automatic Electric Co., includes transistorized negative impedance voice frequency repeaters at about the halfway point in the toll

Albermarle's Mayor D. A. Moose (right) gets first-hand explanation of how step-by-step automatic system works from (left to right) L. D. Coltrane, treasurer and general manager, Concord Telephone Co.; Dr. W. C. Houston, president of the company; and David Braddock, Automatic Electric Co.

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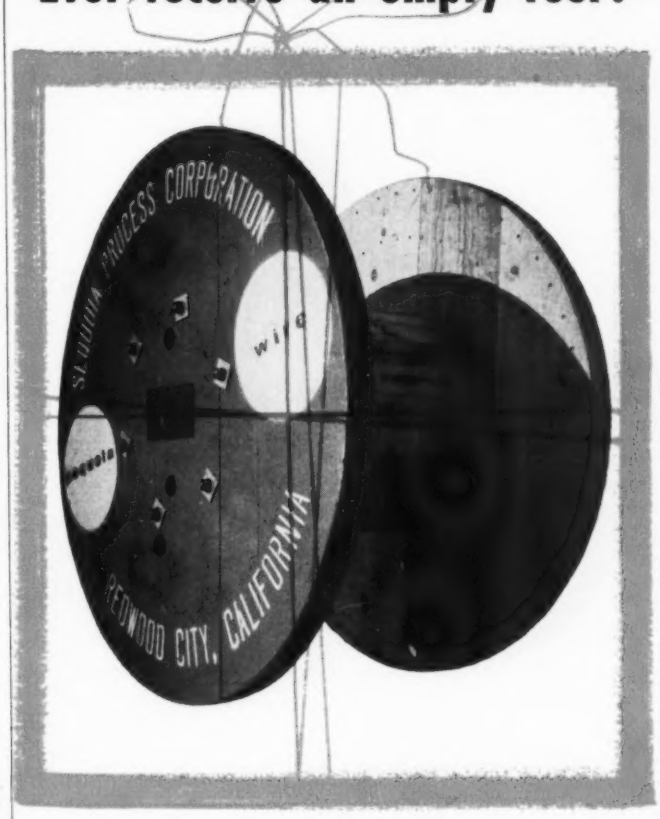

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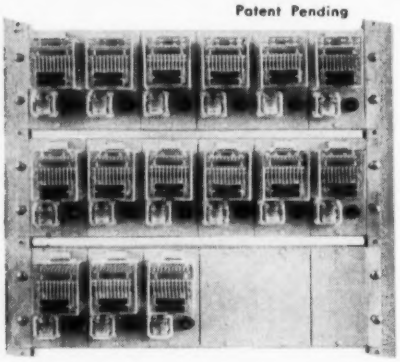

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cable between Albemarle and Concord to further insure quality reception. The two cities are 23 miles apart.

The Albemarle network's subscribers now have extended area service with each other. Unattended exchanges of Strowger automatic equipment were previously installed at Badin, Oakboro and New London.

The new Albemarle exchange building is designed to handle switching equipment and other facilities to accommodate 20,000 telephones and can be enlarged to more than four times that size.

Dr. W. C. Houston, president of the company since 1897, pointed out that the number of telephones in Albemarle has increased from 554 to more than 5,500 since the exchange was acquired in 1934.

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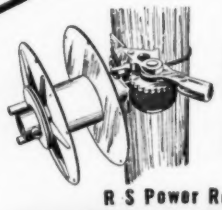

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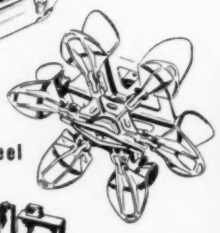

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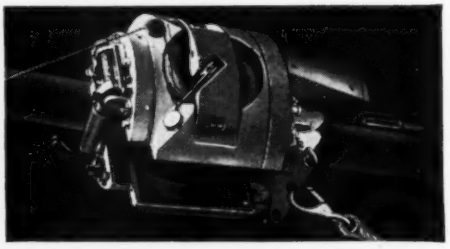

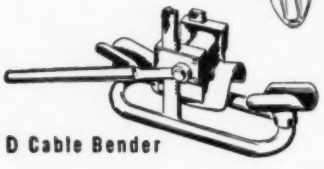

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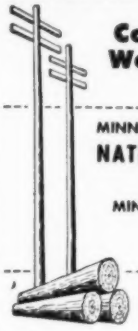

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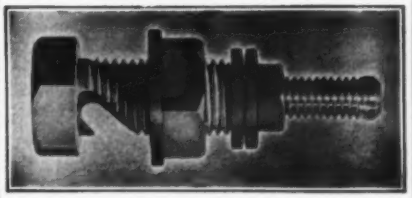

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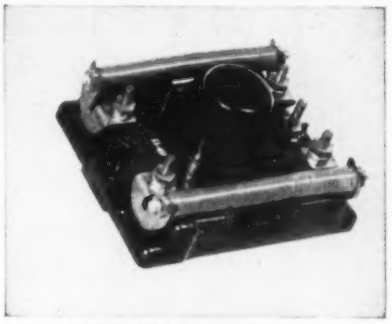

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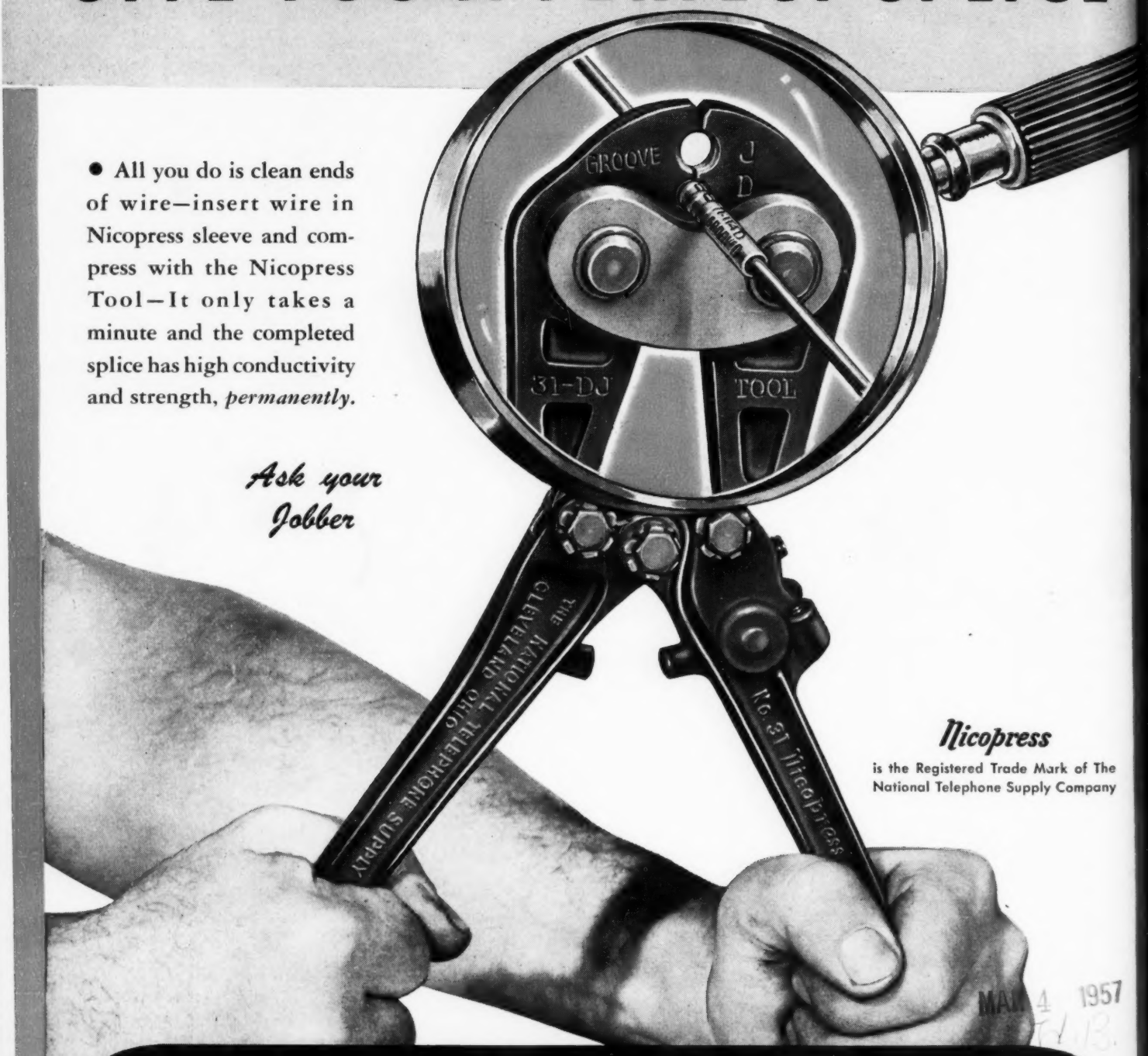

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